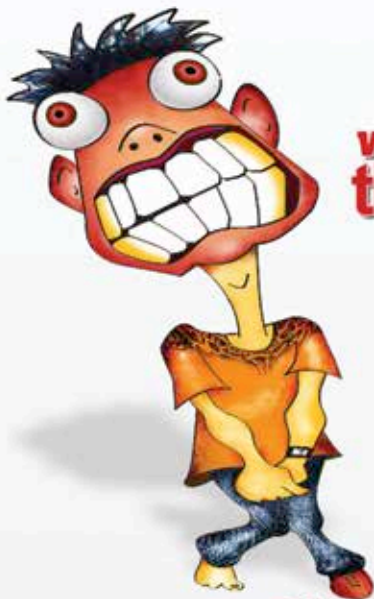


# to Going Green

- ◆ What is green technology and why go green?
- ◆ What are carbon credits?
- ◆ Calculate your carbon footprint
- ◆ Myths about going green and how they're wrong
- ◆ How to go green?
- ◆ Buying right
- ◆ Disposing right
- ◆ Government's green policy
- ◆ Counterpoint: Why going green may actually be bad for the environment
- ◆ Green technology initiatives that will make a difference
- ◆ Chronology of green technology and meet the world's first eco activists





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# GOING GREEN

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CREDITS

The people behind this book

### EDITORIAL

#### Executive Editor

Robert Sovereign-Smith

#### Writers

Abhishek Choudhary,  
Arpita Kapoor,  
Avinash Kothuri,  
Jayesh Shinde,  
Mohit Rangaraju,  
Nimish Sawant,  
Paanini Navilekar,

Raj Saxena,  
Shashwat Shukla,  
Shrikanth Iyer

#### Copy Desk

Siddharth Parwatay  
Infancia Cardozo

#### DESIGN

#### Sr. Creative Director

Jayan K Narayanan

#### Art Director

Anil VK

#### Associate Art Director

Atul Deshmukh

#### Sr. Visualiser

Manav Sachdev

#### Visualisers

Prasanth TR & Anil T

#### Chief Designer

Baiju N.V

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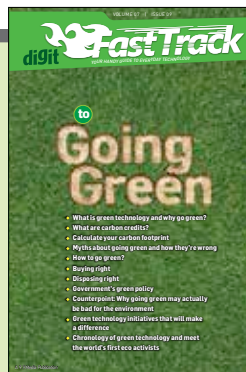
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### September 2012

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# Turn over a new leaf

**M**ankind is slowly waking up to the fact that for our species to thrive we need clean air, drinkable water, and uncontaminated food. At the same time it seems we also need the latest creature comforts – be it your comfortable home, the air conditioning that makes it liveable or the 32-inch LED TV that is vying for your attention as you are reading this book. These symbols of human progress all around you come at a cost. A huge cost to the environment.

The challenge we face today is ensuring that we strike a balance between the cost on the environment and the progress or lifestyle improvements mankind craves. Thankfully there has been a change in the mindset some-

where. Collectively we are making an effort to come up with methods of providing for our endless needs that don't have as big an adverse impact on the environment as before. Today we find that everyone from large corporations to political bodies are all jumping on the green bandwagon. The reasons? Apart from making social sense it also makes financial sense to the companies thanks to legislative penalties and new rules such as product-take-backs and recycling laws. Companies also need to do this because the average consumer is now more aware about environmental issues and more eco-conscious. Green has become the "in" thing, a buzzword of sorts and there is a certain cool factor associated with it. Whatever the reason there is now a push swelling from below all the way to the top. Individuals such as yourself are now trying to do their bit for the environment. This is where this FastTrack comes in.

Specially designed for the environmentally conscious reader (or at least the environmentally curious) this FastTrack will get you on your way to being a green warrior in no time. Going Green really is about making small choices every step of the way - choices that will eventually add up to a lot and help retain a better earth for the generations to come.

In this FastTrack we start slowly with the basics - explaining to you what green technology is all about. Next we demystify certain terms like "Carbon Credits" and "Carbon Footprint" by telling you in simple words what they are all about. The biggest resistance to going green we find comes from certain preconceived notions like "going green is expensive". In Chapter 4 we do a bit of mythbusting and set the record straight. Next comes the bulk of this FastTrack. We give you a step-by-step guide to going green. Whether it's making small choices such as buying the right products or major changes like implementing solar power.

The concluding chapters have some interesting tidbits of information - from a counterpoint for the sake of intellectual debate to the chronology of green activism. You'll meet the world's first green activist - Mr. Nikola Tesla. You've probably read that name. But not in this context we're sure.

So go ahead. Go Green. 



# WHAT IS GREEN TECHNOLOGY?

Lets start off slow with the basics and find out what all this “Eco” stuff is about

**W**e are surrounded by technology and it has encompassed almost all aspects of our lives. A lot of this technology which has made our lives easier, has not been so charitable towards the environment. This is where Green Technology steps in and helps us in some way to protect our environment.

Green technology is a branch of technology that involves the development and application of products, equipment and systems that help in



conserving the natural environment. Green technology also tends to minimize and reduce the negative impact caused by human activities such as manufacturing or disposing of gadgets, which may in any way lead to the degradation of the environment.

## Current problems faced

Human population is growing at an exponential rate. We have crossed the 7 billion mark already and will reach around 9 billion by 2050. We have already inhabited 80 per cent of the planet's surface, so clearly, the habitable area will not be increasing as exponentially as the global population. To accommodate a higher population, more forests will have to be sacrificed. Will there be enough resources to fulfill the needs of that kind of population if we continue to consume energy the way we are today? Estimates say that we will need the resources of almost three Earth's to support the population in 2050. Add to this, the increased industrialization and increased consumerism, how do we ensure that our activities do not harm the environment?

Loss of biodiversity, habitat destruction, depletion of energy and mineral sources, environmental pollution, species extinction, ozone-layer depletion are some of the problems that are staring us in the face. Studies and scientific research on environmental degradation has time and again stressed on the fact that we have few years left to change the way we live, preserve our depleting eco-systems, reduce emission of greenhouse gases. If we are not cognizant of these signs, we are staring at a doomed future.



Exploiting a freely available natural resource which cannot be renewed, beyond a limit is a sure-shot way to add to the environmental degradation. Pollution is one of the main causes of environmental degradation, contaminating natural resources such as air, water and soil. With increasing population these natural resources will continue to get scarce.

As seen in The Matrix it will not be many generations from now, that there will be a blacked out sky. We have two options: either brush them aside or do something which will help in some minor way to reduce these problems at some level.

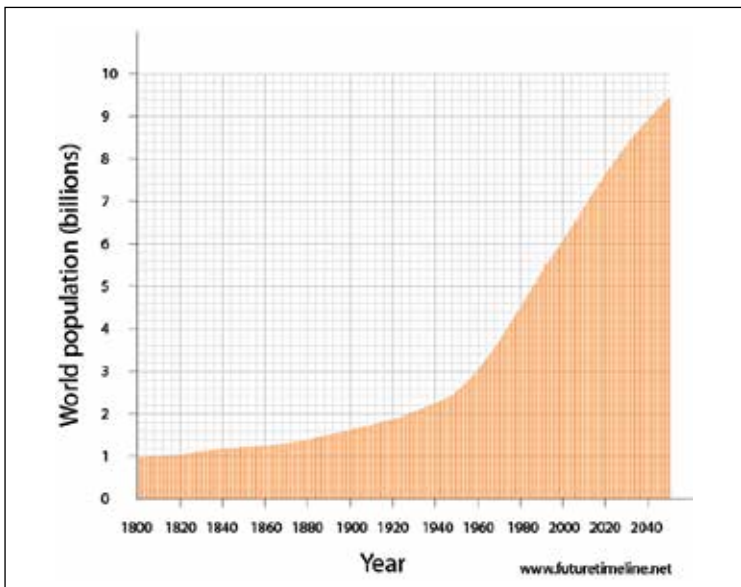
Adapting green technologies is one of the most fool-proof way to tackle this grave environmental problem that we face.

## Goals to make Green Technology prosper

So what exactly constitutes green tech and what are the parameters which should be fulfilled for it to come under green technology?

### ► Renewable Energy

Sustainability is one the main aspects which define green tech. If you are meeting your present needs, without damaging or depleting natural



resources, you have nothing to worry about. Many of the current sources of energy are non-renewable. We consume coal, oil, petroleum and other fossil fuels and it is not uncommon to see prices of these commodities going through the roof every passing day. And it will continue to increase till we find alternative means of fulfilling our energy needs. Add the fact that these resources will not last forever, and with an increasing population that does not look like a very rosy picture.

Another disadvantage of these fuels is that their extraction leads to massive air pollution which in effect may lead to global warming.

Using renewable sources of energy such as sunlight, wind, water to generate energy is the only alternative to traditional fossil fuels. Using solar cells, wind turbines, hydroelectricity, not only keep the environment clean, but also helps us reduce our dependence of fossil fuels making us self-sufficient.

### ► **Reuse and Recycle**

Products should be manufactured in such a way that they can be recycled or re-used after their lifetime. Take your cellphone for instance. Now we know that it will not be lasting you a lifetime, but when it comes to disposing it, would you not like it if each of the component that went into making your phone, could be reused to make something else? Reusing a rare-earth mineral from a discarded cellphone will save its mining. If each manufacturer, makes products keeping the reuse and recycle attribute in mind, then the demands of the population can be kept pace with, without really having to build a new product from scratch. In the long term, it will ensure a delay in the depletion of that resource.

### ► **Optimising manufacturing processes**

Manufacturing processes involves a lot of wastage and leads to a lot of environmental pollution. If these processes are optimized in such a way that wastage and pollution can be brought to a minimum then it will help our cause. How to optimize the process is up to the individual company, but if manufacturers formulate green policies and implement them in their manufacturing processes, then it will lead to optimum use of resources.


### ► **Incentivising green technology**

Making these technologies marketable and economical. If we have a green economy then, sustaining the drive towards green technology will be easier



to implement. Companies employing green technologies should get some incentives from government bodies. Those selling green technologies should be given subsidies wherever possible vis-à-vis non-green technologies.

## Why Go Green?

Why shouldn't you go green? The problems we have mentioned above are real and are having or will have some adverse effect or the other on us soon. You can, at an individual level do your little bit to help. Even something as simple as switching your tungsten bulbs with LED bulbs is a start. Only an aware population can bring about a change. This Fast Track is our endeavor to make you realize the gravity of the situation. In the coming chapters we will tell you various ways in which you can go green, what all you need to do to ensure you are not harming the environment, how to go about disposing your gadgets the right way and much more. 



# WHAT ARE CARBON CREDITS?

We hear a lot of talk and controversy about Carbon Credits. Here's the dope the easy way

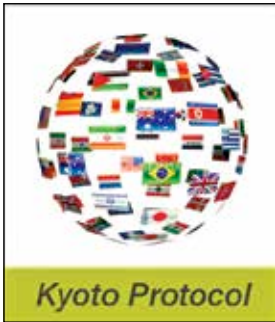
The whole concept of going green may sound flowery and fairytale-like; unfortunately when reality takes a bite, the whole imagery comes crumbling down. In a world as commercial as the one we live in, personal and financial gains tremendously outweigh the need to make our planet a better place to live. In our quest for monetary gain, we tend to overlook the needs of the planet. After all, whether or not



we admit it, the fact is that the whole idea of ‘catering to the greater good’ is just a hobby for some, a myth for most and an ambition for a mere few.

## Setting things right

Since most of the industries rely on fossil fuels, and are responsible for a great amount of greenhouse gas emissions, the Intergovernmental Panel on Climate Change (IPCC) decided to come up with a practical solution to increase awareness regarding these gas emissions and make ‘going green’ feasible for the industrialists – Carbon Credits. When the countries came together in 1997 to sign the Kyoto Protocol, they voluntarily decided to reduce the amount of Carbon they emit into the atmosphere. A financially viable way out was the whole concept of Carbon trading and Carbon credits.



The IPCC observed that giving a real price to carbon would give people a reason to invest in environmentally friendly equipment that release lesser greenhouse gases. A carbon credit could be considered a license showing that the particular individual or company has paid to remove – or reduce the emissions of – Carbon Dioxide from the environment. One carbon credit is a value given to a particular amount of carbon emissions, usually one ton of carbon dioxide or another carbon dioxide equivalent value for other green-

house gases. So basically, the point of carbon credits is to assign a monetary value to the cost of emitting greenhouse gases. So, a whole new market is created where a carbon credit is the new currency, and each carbon credit can be converted into implicit money, thus giving companies, individuals and as a result countries a financial incentive to produce less carbon dioxide.

## Playing the Carbon Trading game

In what could be defined as a last gap measure by worried countries all over the world, the policy formalized in the Kyoto Protocol could now well be viewed as a profitable business venture thanks to carbon trading. Carbon trading is basically the buying and selling of carbon credits in the market, under the allowances and rules set as per the Kyoto Protocol. Under the protocol, each country is given a quota of the amount of greenhouse gases they are allowed to emit, and in turn these countries set limits on the amount of

greenhouse gases run by their corresponding local operators. So, these operators can save up on the amount of greenhouse gases they emit, and if they have carbon credits left over from the quota allotted to them, they can sell it to another company that needs carbon credits owing to it emitting greenhouse gases in excess to the quota allotted to it. This allows for flexibility while making sure that the entire amount of emissions still stays within the cap. Under this policy called the Clean

Development Mechanism (CDM), big companies (usually from the developed countries) that are exceeding their assigned quota of carbon credits can tie up with another company, or with its own subsidiary (usually in a developing nation) and make it more environmentally friendly. A portion of the total carbon credits earned by this smaller company can be transferred to the bigger company. Thus, an operator investing in carbon credits can go for the most cost-effective way to reduce emissions, either by investing in eco-friendly machinery and equipment, or by purchasing carbon credits from another operator who hasn't reached his quota of greenhouse emissions. The cap set for emissions also plays a major role, as a feasible yet strict cap is the best way to ensure reduction in gas emissions. If the cap is too high, then the amount of gases emitted into the atmosphere would be of an undesirable level. And if the cap is too low, then the allowances would be few and overpriced. Like most markets though, some safety valves are put in place to ensure that the value of the allowances lie in a certain price range. In cases of exceptionally high price, the governing body will release extra credits into the market to ensure stability of the price.

Entertaining the detractors A Carbon trading market definitely seems like the right solution to the problem that is greenhouse emissions considering the way it functions. The obvious impacts are the direct rewards to people who reduce greenhouse emissions and the penalties resulting from



violating the cap thus forcing companies to exercise more care. Worldwide, carbon trading would result in lesser overall emissions thus reducing global warming, in turn making the world a cleaner and better place to live in. However, we have a long way to go yet. There are of course many people against the whole concept of carbon trading with solid reasons and some conspiracy theories doing the rounds. To start off, the detractors of carbon trading believe that it isn't tackling the problem it promises to – global warming. Key solutions to the problem of global warming include alternative suggestions to fossil fuels, and therefore the reduced usage of them. Carbon trading, on



the other hand, focuses on reducing the amount of fossil fuels used, but it still revolves completely around the industry being based on fossil fuels. There's no focus on a long-term solution, but on a short-term appeasement. There have been recorded instances of crimes committed against the environment

in the process of executing a particular goal, which is claimed to be environmentally friendly. For instance, cutting down trees to prevent them from being 'victims' of agriculture, and instead turning the areas into production zones for carbon credits. These types of solutions are actually interfering with other solutions to global warming. Another action that drew plenty of flak was the fact that two of the biggest greenhouse gas emitting countries, the US and China, avoided the mandatory caps.

Adding to the lack of belief in the idea were the conspiracies surrounding the idea regarding the actual reason behind the whole concept of carbon trading. Conspiracy theorists claim that the whole idea of carbon trading is a propaganda sold as a solution to global warming to attract us into a scheme where every aspect of our lives is controlled by a group of people in the higher echelons of society. Their argument is that carbon caps would force every industry that burns fossil fuels to have a bonus cost added to its annual expenditure. Thus, every major industry that runs on fossil fuels will pass on the extra cost to the consumer. These prices borne by the

consumer would be based on the prices of the carbon credits, which in turn are based on the scarcity of fossil fuels as monitored by the IPCC. Further, a document tabled by Copenhagen global warming gathering found that all the money resulting from Carbon taxes and the Emission trading schemes would be in the control of the World Bank. So, conspiracy theorists claim that through such organizations, the basic necessities in life are under the control of a higher hand, with names such as Al Gore, Enron and the New World Order popping up. Few theorists take this to a new level by claiming that this is all a part of a plotted depopulation process. That with food prices linked to energy prices, it will only result in decreased availability of food and perhaps starvation on a mass scale. As farfetched as that may sound, the belief that carbon trading is a free trade scandal run by ungovernable and financially driven institutions makes you think twice, doesn't it? The number of frauds that have occurred with carbon trading has definitely tainted its reputability and created an image of it being an investor's nightmare, with the perpetrators of the scams and the salespersons bagging most of the cash.

Technology to the rescue? Coming back to the topic of global warming, a typical household also contributes quite a bit to greenhouse gas emissions. Most of our daily activities contribute to global warming. Of all of our activities, vehicular usage has been proven to contribute more than 50% of our total gas emission output. This is where technology in the form of hybrid cars and cars running on flex fuels shine. A hybrid vehicle uses two or more distinct power sources to run itself. The typical on-road hybrid car would be a cross between a gasoline-powered engine and an electric-powered one. It basically finds a compromise between the gasoline car which has high emissions, and an electric car which has low mileage. As a result, hybrid vehicles




typically achieve greater fuel economy and lower emissions than the conventional gasoline-powered car. Flex fuel vehicles, on the other hand, run on gasoline or a mixture of ethanol and gasoline. Since ethanol is made out of plant sugars, it's considered to be environmentally friendly as it's made out of renewable resources and burns cleaner than gasoline alone. The type of

flex fuel engines range from E10 (10% ethanol, which is standard unleaded gasoline) to E85 (85% ethanol) and various combinations in between. While these might seem like able substitutes for our age-old gasoline vehicles keeping the environment in mind, they're not practical answers either. Take



the case of Hybrids for example: they're fuel economical, environmentally friendly, look and feel amazing and deliver decent performance. However, financially it doesn't sum up to be all that attractive. On an average, a hybrid car would reduce about a ton of carbon dioxide emission in

the atmosphere, which when converted into carbon credits won't amount to much of a saving. Given the cost of the hybrid engines (compared to normal engine) which can run into lakhs, this doesn't seem viable, does it? Flex fuels that run on ethanol also raise concerns as the process used to make ethanol emits a lot of greenhouse gases.

Most ideas, as they begin, are novel and aimed at serving a purpose. Unfortunately, most of the novelty gets lost in the process of execution, and we end up with something that caters to a completely different purpose behind the veil of goodwill of the original idea. Carbon credits, perhaps is not very different either. With the market being controlled by various groups, corruption and fraud is but inevitable. Carbon credits being the base for the emission trading scheme is a good idea, but loses its way since it's not substantially credible. However, with further improvements to the system, we can expect to see the save the world cause move in the intended direction. 

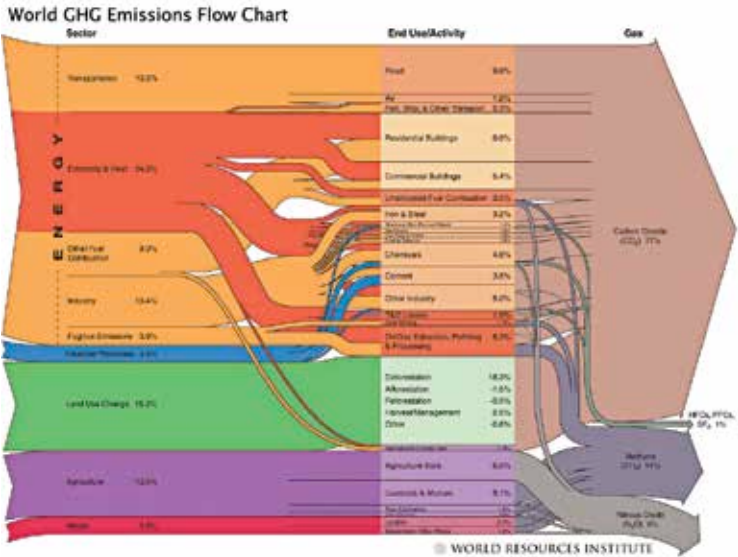




# CALCULATE YOUR CARBON FOOTPRINT

You must've heard the term "Carbon Footprint" a lot these days. What does it mean? And how do you calculate it? Read on to find out...

**C**arbon Footprint is defined as "the amount of carbon dioxide or other carbon compounds emitted into the atmosphere by the activities of an individual, company, country, etc". This sentence sums up the motive behind the formulation of major policies in



evant 100-year global warming potential” but who understands that gibberish. Let’s translate that into layman’s terms. Your carbon footprint is the amount of carbon dioxide (or carbon dioxide equivalent of greenhouse gases) you produce directly or indirectly (we’ll visit the direct and indirect part in just a minute).

Just for comparison, note that Methane absorbs ten times more sunlight than a carbon dioxide molecule. This means that the amount of heat absorbed by a molecule of methane is equivalent to ten molecules of carbon dioxide. Carbon dioxide is emitted by nearly all major human activity from manufacturing goods to making roads, producing and transporting food to providing services. Even a Google search produces carbon dioxide. In 2009, Google revealed on its official blog that every Google search produces an average of 0.2g of CO<sub>2</sub>.

Now let’s come back to our topic of direct and indirect carbon emissions, also known as primary and secondary footprints. A primary footprint is a measure of the direct CO<sub>2</sub> emissions due to the burning of fossil fuels. An example of this is driving a car or hopping onto a plane. Not only this, it also includes your domestic energy usage such as through cooking etc. The secondary or indirect footprint is produced by every product used by you. This is emitted during manufacturing, transportation and eventual

breakdown. In major developed nations, it has been seen that a major amount of carbon footprint emission takes place far away from the end consumers. The world's biggest kiwifruit exporter, Zespri International, says that each 1kg of its New Zealand-grown green crop eaten in Europe generates the equivalent of 1.74kg of carbon dioxide in greenhouse gases – transportation across the globe and storage being reasons for the huge amount of CO<sub>2</sub> being produced.

Hope you've understood now why the calculation is such a tedious process. The more we buy, the bigger is our carbon footprint. Even a Google search produces CO<sub>2</sub>

But why should we be bothered about carbon footprint? Did you notice the floods in more than seven states in India and drought in the others? And the floods in China and Russia? Did you ever see so many natural disasters in a single year in the past? The numbers continue to rise. One of the main reasons being high and reckless consumption of fossil fuel.

We'll now get to the interesting part: finding out your carbon footprint and knowing how quickly you're killing Mother Earth every time you take a flight or eat a kiwi.

## Let's do the math

We all like the easy way out so let's start by going online to help you calculate your carbon footprint. There are many free calculators available and here are three of those that you'll find useful:

### ► **footprintnetwork.org**

<http://dgit.in/NwuIcv>

First in our list of online calculators is footprintnetwork.org. This is a site dedicated to educating people on their carbon footprint. It supports specific nations (including India, and also supports Hindi). The calculator asks you to select your country of residence and then calculates your carbon footprint based on a set of questions. The good thing about the system is that after calculating and comparing your footprint with your country, the world average and the highest carbon contributors, it tells you ways to reduce your footprint in a “do-able” manner.

### ► **ICICI Bank footprint calculator**

<http://dgit.in/S879Zu>

Followed by the footprintnetwork.org is a calculator provided by the

ICICI Bank website It's an India-specific calculator that helps you keep a track of your carbon footprint produced by activities such as travelling, electricity consumption and number of LPG cylinders used per month

► **Carbonfootprint.com**

<http://dgit.in/PSOOuo>

Third in the list is a very comprehensive yet simple calculator that takes various parameters into consideration to estimate your footprint. It may take some time to input the values into the system but the greater the detail, the better the estimate! The results may vary from software to software though depending on the detail accepted by the system but you'll get a rough idea of your footprint. The system takes into account your household electricity and fossil fuel usage, flight, car, motorbike and public transport usage and secondary carbon contributors such as food preferences, imported goods preferences and the amount you recycle.

## Carbon Footprint – The old school way

If you want to do it the way your mom does it with a pen and paper – maybe because like her, you have trust issues when it comes to using software – run to your study desk and get a pen, paper and your last year's bills. Once all your greenhouse gas contributing bills are in place (this would include electricity bills and natural gas bills or gas cylinder bills, among others) estimate the number of kilowatts of electricity that you use in a month. Each kilowatt of electricity produces approximately one kilogram of carbon dioxide. To find out the carbon footprint of your vehicle, find out the number of kilometres or miles you drove in the past year. This will give you the number of gallons or litres of fuel that you used in a year. When you multiply the number of gallons by nine, you get the kilograms of carbon dioxide that your vehicle produces in a year. Note that 1 US gallon is equal to 3.79 litres.

Next in line is your footprint produced by airplane travel. To calculate this, all you need to do is total up the number of miles that you travelled by air in the past year (this data is available on your ticket). Once you get the total air miles travelled, multiply this number by 0.23. This will give you the number of kilograms of carbon dioxide emission. When you've figured out the number of carbon dioxide emissions for each of these activities, calculate the total of the kilograms of carbon dioxide emissions. Now, divide this value by 1,000. This will give you the metric tons of CO<sub>2</sub> emissions by

you. This is your carbon footprint. And this is just your primary footprint; we've not even mentioned about your indirect contributions to the depletion of earth's natural resources.

## Plan of action – to protect and preserve

This might be a scary number as it tells you the consequences of your actions on the environment. Well, what's done is done, but awareness without the determination to improve is useless. We all know that planting trees is one of the ways by which to save nature from the ravages of our uninstructed actions, but what if you live in Mumbai and don't have the luxury of huge open spaces? You can still offset your carbon footprint. One method is to donate money to NGOs to plant saplings on your behalf in protected areas. All major airlines have a tie-up with one or another of these NGOs, and give you an option to pay for the sapling plantation during the process of ticket booking. Although it may seem like this will take plenty of dedication and control, this method is inspired by the popular saying "Prevention is better than cure" and it's just small steps that you need to take to save our future.


You must have heard and read some of these on billboards and in newspapers but seeing how we all suffer from selective memory, we'll do a recap. Listed below are major ways by which you can offset your carbon footprint. Not consciously doing so can have the extreme opposite consequence and reasons why there's so much power wastage, not only in India, but across the globe.

- ▶ Turn OFF your lights, TV, DVD player, computer, fans and basically every appliance when not in use and NO, putting it on standby doesn't help
- ▶ Make sure that your Air Conditioner's temperature is around 25 degrees; it's a comfortable temperature and saves a lot of power





- ▶ Run your washing machine and dishwasher with a full load, as it uses the same amount of electricity as when run at half load
- ▶ Carpooling is a good option; saves money and the environment.
- ▶ Use CFLs or, if possible, LED lamps
- ▶ Recycle water (making a kitchen garden is not very time consuming) and paper
- ▶ Buy electric appliances that have a high BEE rating (are highly energy efficient).
- ▶ Use public transport and jog if possible! Save money and stay healthy
- ▶ When in a hotel ask for water saving fittings
- ▶ Buy local fruits
- ▶ Reduce your consumption of meat
- ▶ Avoid buying packaged foods as the packaging has a large carbon footprint
- ▶ Buy organic produce
- ▶ Plant some veggies in your balcony. Before the rainy season began, one of our Digitians planted Taro (Arbi in Hindi) in his house. Not only will you be able to eat your own home-grown veggies but will also have more than enough to give some to your neighbours since the plant will be producing more than you can consume
- ▶ Recycle anything and everything you can

There's an endless list of ways by which you can bring down your carbon footprint. Maybe you have an easier, cheaper and better way to do it. For instance, another Digitian came up with the concept of a window garden due to lack of a balcony at his place. Now his place looks more inviting and makes friends want to hang around longer. Almost sounds like an infomercial but it's so true. So be innovative and write in to [editor@thinkdigit.com](mailto:editor@thinkdigit.com) if you've come up with such creative ways to save the world. 



# MYTHS ABOUT GOING GREEN

Going green isn't that hard, but let's get a few things straight first

Going green seems to be almost a no-brainer, yet many desist from adopting more environmentally friendly practices in everyday life. Still worse, many believe going green might actually be detrimental to their everyday lives, as perpetuated by myths about going 'green'. We think going green not only makes sense, but will actually be beneficial to you, your surroundings and the society at large. Having said that, here are a few commonly held myths and beliefs about going green. By clearing these misconceptions that you might hold, we hope to ease your transition into a green, environmentally friendly lifestyle. Note that not all these myths are intended to coerce you into adopting well accepted 'green'

practices. Some of these well accepted practices may be causing more harm than good, so you should carefully evaluate your choices before making one.

### 'It's too expensive'

Probably the most popular myth that deters people from going green is that 'Green is expensive'. This misconception arises out of a belief that in order to adopt a greener lifestyle, one needs to discard one's current one and buy newer, energy efficient products. Nothing could be farther than the truth. Going green does not entail refurbishing your house or getting a new car.



Even though CFLs may cost more, the energy savings in the long run make them a smart choice

Going green means adopting practices and habits that cut down on wastage of resources, like water, fuel or electricity. Instead of spending a small fortune on a Prius, try to adopt practices that cut down on fuel usage in your existing car. Drive at a higher gear, turn down the air conditioner (or avoid using it altogether) and get your car serviced regularly. Using fuel efficiently will actually lead to increased savings. Similarly, using the air conditioner at the right temperature can lead to significant savings in energy and money. Most organizations (including Tata Power) recommend setting the air conditioner to an optimum temperature of between 24C – 26C. For every degree that you lower the temperature by, you're consuming nearly 10% more power, but the change in cooling is barely perceptible. There are many, many more ways to cut down on energy usage in your home, and this handy list by Tata Power should get you started - <http://www.tatapower.com/sustainability/powersaving-tips.aspx>.

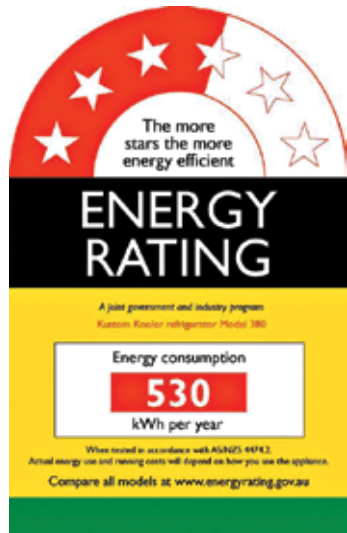
While using your existing appliances and devices efficiently can certainly go a long way, spending a little more upfront for increased savings in the long run is certainly a wise choice. CFLs cost more than conventional tube lights or incandescent bulbs (\*shudder\*) but think of the additional cost you'll be incurring every month on energy bills with a 60W bulb or a 40W tube. Spending a little more on energy

efficient appliances is analogous to buying a car or a house with a marginally higher down payment but lower EMIs. You're actually SAVING money in the long run.

## Holding on to old appliances is a form of recycling

While you might be tempted to hang on to that old washing machine or electric geyser that you bought with your first pay cheque, you'll be disappointed to know that it doesn't constitute recycling. Home appliances, particularly washing machines, dishwashers, heating /cooling appliances and incandescent bulbs actually get more energy inefficient with age, so it's probably a good idea to buy newer ones. Most new appliances are engineered with the intention of cutting down on wasteful energy expenditure and come with an energy 'star' rating - the more stars a product has, the more money and energy you'll save every year in using that product.

Another little known practice that can effectively reduce the stress on our power grids is choosing the time of the day to perform your daily (energy consuming) chores. The energy demand from power stations during the peak hours of the day (9am to 6pm) tends to be much higher, and coping with additional power requirements during these hours can prove disastrous to the environment in the form of increased utilization of coal. Try to schedule your tasks either before or after this period, or put them off until the weekend.



Look for the star rating while buying a new appliance

## Organic foods are healthier and more environment friendly

Organic foods, when they arrived, seemed like a win-win situation for the farmers, consumers and the environment as well. They cost more

(sometimes even twice or thrice that of conventional crops) but the health benefits seemed to counterbalance the cost. Every thought organic foods were pesticide free and were hence superior alternatives to regular, conventionally farmed produce.

The reality is quite different. Organic foods ARE subjected to pesticides while being produced, but what is different is the nature of these pesticides. Simply put, organic foods are farmed using organic pesticides. As reported by the Scientific American, “Organic pesticides are those that are derived from natural sources and processed lightly if at all before use. It has been assumed for years that pesticides that occur naturally (in certain plants, for example) are somehow better for us and the environment than those that have been created by man. As more research is done into their toxicity, however, this simply isn’t true, either. Many natural pesticides have been found to be potential – or serious – health risks.” (link - <http://goo.gl/xSWb9>) An example of this is Rotenone, a widely used pesticide and insecticide derived from the roots of some plants. Since the chemical can be naturally obtained, many would be led to believe that it is benign. However, Rotenone has been known to cause Parkinson’s Disease by attacking the mitochondrion of cells.



Organic Foods: There's a lot more to them than meets the eye



On the other hand, opting for foods that have been farmed using little or no pesticides may also present health risks. Studies have shown that organically prepared foods may sometimes contain almost five times the bacteria (specifically E.Coli and Salmonella) found in conventional foods. The reason behind this is not only the lack of pesticides allowing cultures to grow, but also the use of natural manure instead of chemical fertilizers. Manure contains fecal matter which is highly contaminated.

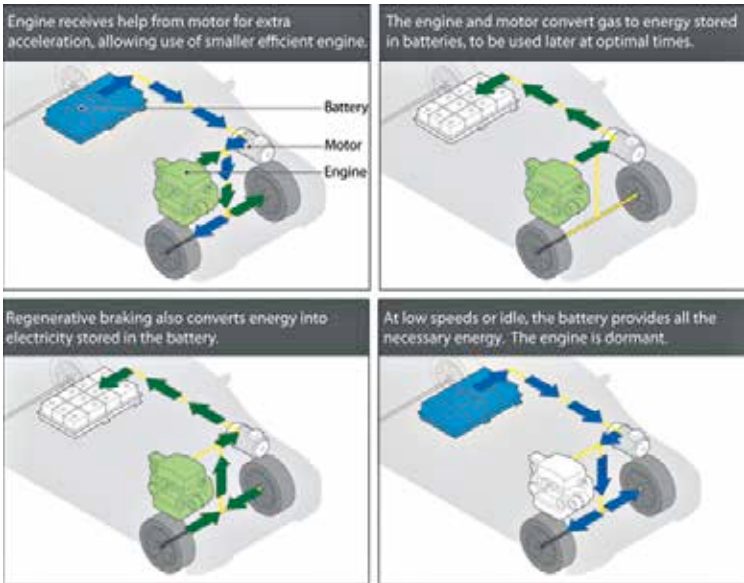
On a much larger level, organic farms produce almost 50% - 80% lesser produce than conventional farms of the same size. In a world where millions suffer from hunger and starvation, switching all farms to the organic variety seems almost cruel. Alternatively, existing natural habitats may have to be ploughed down to make way for more organic farms, in order to meet the growing demand. So they're not exactly eco-friendly either.

The point we're trying to make is that organic farming isn't a villain masquerading as an environment saviour. We're trying to say that organic farming isn't as glorious as its made out to be, and certainly has its down-sides, whether they affect us humans or the environment. When it comes to foods, your best bet is to go for stuff that's been locally produced and is in season (so it hasn't been subjected to preservatives).

## The Myth About Hybrid Vehicles

Hybrid vehicles – ones that use a combination of a conventional fuel engine and an electric motor, emerged as a common answer to the fossil fuel guzzling cars. While this is a potent combination, many misconceptions exist around these cars, one of them being that they “aren't powerful enough”. While you can't expect Ferrari levels of performance from these vehicles, hybrid vehicles do deliver respectable performance comparable to their diesel / petrol / gasoline powered siblings, as they are usually powered by identical engines. Recent advances in electric motors by companies like Lexus and Honda have ensured that hybrid owners aren't left behind in the race.

Secondly, many consumers mistake hybrid vehicles with pure electric vehicles. By doing so, they assume that a hybrid vehicle needs to be plugged in and charged before it can be used, or that hybrids can't be used for long distances. Hybrid vehicles are a 'hybrid' or a combination of the two technologies, and use a technology called 'regenerative braking'. What this means is that the car will run normally on conventional fuel, but while braking or decelerating (a process where fuel is traditionally




Regenerative Braking ensures efficient use of both the fuel and electric motor

wasted) a portion of the fuel's energy is transferred to the car's battery, thereby charging it on the go.

While hybrid cars have their own merits, they're not quite as energy efficient as they're made out to be. Hybrid alternatives typically cost about 30% more than their conventional counterparts, but the savings in fuel costs are not always proportional. Studies on the 2003 model of the Honda Civic Hybrid against its conventional model showed a very slight increase in fuel efficiency – the hybrid offered 36 miles per gallon as opposed to 29 miles for the regular (non-hybrid) version. Consumer reports have shown that in order to generate significant savings, one would have to use a hybrid car continuously for more than 20 years.

The unique braking-charging phenomenon also means that hybrids are suited for driving conditions which require you to brake often, as in a city. This is the reverse of what is generally observed with conventional vehicles. In turn, significant fuel and energy savings can be realized only in the appropriate conditions, and if you intend to use your vehicle for a lot of long distance trips, you're probably better off practicing some smart driving in your existing car itself.

## **'It doesn't make a difference'**

You'll be surprised by how much it does. Every single person working toward a greener tomorrow means a reduction in the world's energy usage and a reduced strain on our (rapidly depleting) natural resources. By making slight modifications to our lifestyles in the form of way we commute, the way we eat or the way we work, we make small but significant changes that will ultimately go a long way. After all, you'd much rather be a part of the solution, wouldn't you? 



# HOW TO GO GREEN?

Now that you've learned theory, you must be eager to know how you can make a difference. We show you the way...

**A**fter going through a lot of theory on going green, carbon credits and similar terms. What a normal individual like you can do, to go *green*? Can a normal individual like you, do anything, if at all. The answer is yes! We've presented several tips in the following pages. Some of them are pretty easy and some of them are pretty hard. But, I think it's time to look at all of them and get some awareness about what we can do to make this planet sustain longer.

## Bring your own

This section discusses about simple things that you can bring on your own which can save huge amount of garbage.

### ► Reusable cloth napkin

Paper napkins are very easy to rip and tear and they create a lot of garbage, as they are meant to be thrown away. Estimated usage of paper napkins is over 160 billion annually, which is equivalent to the destruction of 34 billion trees annually!

But, in comparison to the paper napkins, cloth napkins are much sturdier and can bear some rough handling. Taking Indian food into context, paper napkins fall apart easily when wiped against greasy fingers and about five to seven napkins are required per person per meal. On the other hand, one cloth napkin will be sufficient for the same purpose and can sometimes be reused several other times, if you carry your own.

### ► Reusable coffee mug

Typical paper-coffee cups are not made from recycled paper. In fact, they are made from virgin paper boards. Now, why do they do that? Why can't they use recycled paper? That's because recycled paper is not strong enough to hold your coffee! These coffee cups are meant to be thrown and huge amount of natural resources go waste everyday!

A better alternative could be to use your own coffee mug, especially at places where you visit daily such as your office, home, and hostels. This might save about 1.4 million tons of wood, which could power around 77,000 households!

### ► Water in reusable bottles

Who doesn't like the convenience of bottled water? But, we would like to specify the inconvenience caused by throwing plastic bottles around. These bottles should actually be recycled in theory. But, practically only one out of six bottles is recycled. Apart from recycling, a huge amount of crude oil is used in the manufacturing process of these bottles. According to some statistics, approximately 17 million barrels



of crude oil is used to make plastic water bottles in the world. This amount of oil is enough to keep a million cars going for twelve months!

Using Reusable water bottles instead of using bottled water can help. Try carrying a water bottle everyday to office and use it to drink water instead of using a plastic glass or bottled water. This can save huge amounts of plastic garbage and oil.

### ► Reusable cloth bags

Every year 500 billion plastic bags are being used around the world! These are thrown away in landfills. These take more than 400 years to decompose and will still emit toxic materials after breaking down. It's needless to say how harmful it is to the nature around us. Numerous animals and birds die due to accidental consumption of these plastic bags. Unfortunately,



India has become one of the largest importers/disposers of plastic waste in the world. Not only disposed plastic from India is filled up in the landfills here, but also the plastic waste from major countries such as USA, UK are also disposed in India.

Carrying our own carry bags while shopping can save the burden of scores of plastic bags strewn on the streets. Government has restricted the use of plastic bags in all shopping centres in all cities. But, many people do not yet follow the rule and prefer using plastic bags instead of carrying their own bag or using reusable cloth bags. Start using reusable cloth bags and save them to use it the next time.

## Maintain

“It’s a generation of use-and-throw”, says our previous generation! I think it’s time to re-look at this part of our habits a little bit. Use-and-throw might be pretty convenient in today’s fast-paced life. But, that’s causing a lot of harm to the environment. Here are some simple things you can do to reduce the dump from your end:

### ► Maintain your vehicle

Maintaining your vehicle not only benefits you personally by extending the life of it, it also benefits the environment in a lot of ways.

Firstly, it saves a lot of gas. A properly maintained vehicle with clean air filters and inflated tyres can greatly improve your vehicle's performance and it takes less gas when compared to a non-maintained vehicle.

Secondly, it also reduces the probability of you discarding the vehicle. Discarded vehicles, if not reused, cause a lot of waste and are not disposed properly; especially in India. Hence, maintaining your vehicle and not switching to a new one soon, will be quite helpful to the environment.

### ► **Maintain your appliances**

Maintaining your appliances by replacing those 10-year old energy inefficient parts with new energy efficient appliances can save you a lot of bucks and count in your going green initiative also. Here are some tips that can help you maintain your appliances.

#### **Refrigerator**

- Make sure to clean the condenser coils at the back of your refrigerator; it improves the efficiency of refrigerators by about 30 per cent. These coils transfer the heat inside the appliance to the outside, keeping the temperatures low inside. If these coils get stuck with dust, it hinders the dispersal of heat and thus your fridge requires more energy to keep your stuff cool inside.
- Remove all that clutter from the top of your fridge. It blocks the air circulation and makes your compressor inefficient.
- Check the location of your refrigerator. Keep ample space between condenser coils at the back and the wall to allow for smooth air-flow. Make sure your refrigerator is not surrounded by other heat producing appliance such as ovens.
- Check if the door seal is held tight and no cool air escapes.

#### **Air Conditioner**

- Don't allow dust and debris to set on the condenser coils. If you see dust accumulated, clean them immediately.
- Clean or replace the air filters after three months of use.
- Make sure that the inside evaporator coil is free from dust and debris. Dust acts as an insulation and makes it difficult to absorb heat.

### ► **Maintain your laptops and devices**

The rate at which electronics is disposed in India is immense. Cost of



repairing and maintaining an old phone is greater than buying a new one! But, what one needs to understand is the amount of e-waste that is produced due to this process. Proper maintenance of your laptops, phones and electronics will not only increase their lifetime, but also will save up a lot of power.

## Utilise paper optimally

Taking a little extra care about the way we are using the paper can change a lot. Here are some of small steps everyone can take which will bring a lot of changes.

### ► Use both sides of paper!

To start with this is something really simple - use both sides of the paper! We have a natural habit of printing on only one side of the paper. Try making a culture in your office that printing on one side is unacceptable. Start appreciating people who print on both sides of paper. This will save half of the trees that are being cut for paper.



### ► Recycle newspaper

Newspapers can be used to clean glass, wrap gifts for kids, and liners for pantry items. There are a lot of places in every city which take old newspapers for recycling. Take out some time every month or so to drop off your old newspapers/magazines.

### ► Buy recycled paper

Twenty cases of recycled paper saves 17 trees, 390 gallons of oil, 7000 gallons of water, 4100 kWh of energy, eliminates 60 pounds of air-polluting emissions and saves 8 cubic feet of landfill space.

So, just imagine if all your home or office paper is recycled paper; you would be saving a huge number of trees every week. Persuade your office staff to buy recycled paper and use recycled paper at home too. A mild Google search will yield a lot of results on where to buy recycled paper nearby in your city.

### ► Used papers on telephone tables

Everyone needs papers around the telephone desk to write notes or that

telephone number or just to scribble while talking. Put already used papers around your telephone desks and this could actually save huge amounts of paper for you!

## Watch your power

According to statistics, power worth more than \$100 million is wasted every year in the US. In India, people don't even calculate the amount of power wasted. Smart usage of power can help reduce this wastage a lot.

### ► Use rechargeable batteries

Rechargeable batteries, despite costlier investments, saves the hassle of buying new batteries every time a battery gets drained. If used properly, these rechargeable batteries will last quite long too.

Whether rechargeable or not, they finally end up in a landfill and a very minor portion is actually recycled. With our effort of using rechargeable batteries, we can at least make sure of reducing the amount of batteries in those landfills.



### ► Change your lights

If almost every household in India replaced one regular electric light bulb with a fluorescent bulb, it would lead to reduction in pollution that is equivalent to removing one million cars from the road. Many people complain about the lack of options in the variety of colors that these fluorescent bulbs come in. But, these bulbs can still be used for closets, laundry rooms and other places where you don't spend much time. Department of Energy says that, a 20 - 23 watt CFL produces almost the same output of light as a 100 watt incandescents and will last almost ten times more, so the cost would ultimately be covered even if you buy a CFL next time, instead of a regular electric bulb!

### ► Turn off computers and laptops at night

This is one of the most common advice given by everyone, but followed only by a few. People leave their PCs into sleep mode, because they hate to close all their working copies and turn the PC on again in the morning.

One solution to this could be to set the PC to automatically turn itself 'ON' at a particular time every day. Try changing your power settings to something that is more power-saving friendly. This not only saves power, but also increases the lifetime of the electronic device and in-turn reduces the probability of it being thrown away early!

► **Do not preheat!**

Unless you're baking bread or pastries of some sort, preheating the oven is not required. Just turn it on when you put the dish in.

Also, avoid opening the oven door and pot lids as heat escapes in this process. Look through the oven door instead, to check on your food.

► **Switch off lights and fans when not in use**

It's not very difficult to inculcate the habit of switching lights and fans when they're not in use or when you are leaving a room. Tell your friends and family to begin in their own homes. Save electricity! Power losses in India due to negligence was around Rs. 68,000 crores. This could light up numerous households in villages that don't even have continuous power supply.

► **Unplug devices/printers when not in use**

Many devices, draw some power even during standby. This is called as 'StandBy Power'; some call it 'Vampire Power'. The only way to avoid this is to unplug the device. Many studies show that this might save up a couple of hundreds on your monthly power bill also. So why don't you give it a try from today?

► **Use your Washing Machine more efficiently:**

When you are washing clothes, maximize the efforts by only running full loads. This saves up a lot of energy. Try to avoid the Cloth Dryers also, as that energy can be saved easily by hanging your clothes. And your clothes will last longer if they are not exposed to the punishing heat of the dryer. So, hanging your clothes is not a bad option after all!

## Get Solar

Solar Energy is a sustainable form of energy available to mankind, which can replace oil and other non-renewable forms of energy. Half an hour of sun's energy on Earth's surface, if captured can provide energy needs for the



Solar panels creating clean energy

whole world for an year. Even though Solar technology is not very advanced presently, supporting solar by buying the solar equipments will boost up the Industry and in-turn will lead to more research and funding in this sector. Even though, solar-powered equipments can't be used for long, they can be used as alternatives for things which are used for limited time period.

Following are some of the solar equipments presently available and can be used to save power.

#### ► **Solar Charger**

Use a solar powered cellphone charger, instead of a regular electricity-based mobile charger. Just leave it out in the sun for eight hours and you'll see that it works just similar to the one that runs on electricity.

#### ► **Water Heater**

Use a Solar-based water heater instead of the one that runs on Electricity. As Water-heaters are used only for limited amount of time in a specific period, this is a possible option. This might not work in some seasons though, yet it's worth giving a try.

#### ► **Emergency Lamps/fans**

Use a Solar Emergency Lamp/Fan rather than a electricity/battery based

emergency lamp/fan. They have a life of about 2-3 hrs once charged fully and will definitely serve the purpose of an emergency lamp.

## Save Water

### ► Check pipes for leaks

See that pipes at your home are not leaking. A small drip from a leaking pipe can waste more than 20 gallons of water per day.

### ► Use your Toilet Flush wisely

Don't use your toilet flush as a wastebasket. Use trash cans to dispose things like Cigarette butt, facial tissues. This can save about 5 to 7 gallons of water every day.

### ► Switch off the tap

Switch off the the tap while brushing or shaving. Use a water mug instead of running tap for these purposes.

### ► Take shorter Showers

This one's not for the faint at heart, but if you really care for the environment, use a ultra-low-flow version unit on your shower. Implementing this can be real hard; but this should be given a try.

### ► Reuse Water

Water used for lot of purposes can be reused again. Like, water used to wash vegetables can be used to water the plants, etc.

### ► Harvest Rain Water



Rainwater harvesting unit

Harvesting Rain water can be a very intelligent technique of saving water. The episode of Satyameva Jayate on Rain Water harvesting provided a very nice insight into how people can actually do it. Housing Communities and Societies should try to take some measures to harvest rain water, which can be quite beneficial especially in cities.

There are mainly 2 ways in which Rain Water can be harvested:

1. Surface Run-off harvesting
2. Roof Top Harvesting

Roof Top Harvesting is something that can be implemented easily at Home. This can be done by maintaining sloping roofs or collecting the water on the roof and directing it to a storage tank. This water can be used for a lot of other purposes if you don't fancy using it for drinking.

### ► **Implement Grey-Water recycling systems**

If possible, pool in some money in your neighbourhood and try to implement a grey-water recycling system//plant. Grey Water is basically the wastewater that is generated from daily household activities like laundry, dishwashing and bathing. This water can be recycled with the help of some treatment and can be used for a lot of purposes. Though, the recycled grey water is not safe for drinking, this water can be used in toilet flushes, to water plants and for other cleaning purposes.

Proper Rain-Water harvesting system along with a grey water recycling system can make your neighbourhood literally self-sustainable.

## **Manage your trash**

**Split:** Separate your trash into three: biodegradable (such as food scraps), clean non-biodegradable (such as paper and plastic bags), and dirty biodegradable (such as juice packs). Use the first to compost, and as a natural fertilizer for your plants. Clean non-biodegradables can be reused. Dirty non-biodegradable waste can be resold to recyclers. This will help in disposal of wastes in a better way.

## **Get organic**

Anyone who has watched the episode of Satyameva Jayate on Food pesticides, will know the importance of getting Organic. Some of the shocking things that are notified in that episode are:

There are around 67 types of pesticides that are still used in india during farming, which are banned in all the other countries. Farmers in India use many more banned pesticides also illegally and all this goes into our daily food. And the worst part is we are being exposed to a huge number of pesticides all at once! And no one knows its true effect. Moreover, this chemical farming has led to killing off whole species of birds, near extinction of many other species and erosion of the soil also.

Countries like USA and many in Europe are turning Organic and spreading the word about the advantages and use of getting Organic. It's high time, we get organic in India.

### ► Organic food

Getting organic food is the first thing that we must try to do. A little bit of asking around or a Google search will yield you enough results of where you can find organic food in your neighbourhood/city. Many organisations have come up who are supplying fresh organic foods in all the metros.



One of them is “downtoearth”. You can check it's store locators here: <http://www.downtoearth-organic.com/location.aspx>

Some farms such as Borkar farms even offer services such as home delivery for people in and around Mumbai and Pune.

A lot of large retail food outlets have departments dedicated towards organic food

which generally goes unnoticed. Spread the word about organic food and the importance of buying these foods. They might be a little more expensive than the normal “chemical food”, but it's worth those extra bucks!

### ► Organic makeup

‘Phthalates’ is one of the compounds that cause diabetes and unfortunately it's found in large amounts in Make up such as perfumes and air fresheners. Today, we're exposed to chemicals even without our knowledge. Inorganic perfumes contain huge amount of chemicals which affect humans in a lot of ways. It contains benzene derivatives, aldehydes and many other known toxins and sensitisers - capable of causing cancer, birth defects, central nervous system disorders and allergic reactions.

There are only two ways to avoid this huge amount of toxic that's entering your system:

Stop using make up and perfume! (is this even remotely possible?) or switch to organic make up.

Organic Makeup is made from plant materials or from its derivatives or from minerals, which are natural and don't harm your body. MNCs like



Loreal are trying to go Organic with acquisition of a French Organic MakeUp company. But, these MNCs still heavily rely on their chemical cosmetics.

There are some Organizations which purely deal with Organic Products in India. Some of them are - Astra Berry, Soul Tree, Aroma Magic, etc. Big players who deal with Organic products have not yet entered the Indian market and it's on us to boost up this Industry. Spread this message among your community, neighbourhood and office and educate people the advantages of choosing an Organic product over a chemical one. This can make a lot of difference.

### ► Organic Fabrics

Synthetic Fabrics are clothing made from Synthetic Fibres. In simple words, it's "Plastic Fabric". Some of the examples of plastic fabric are polyester, acrylic, nylon. These are easy to wash and reuse, very economical and easy to produce in mass quantities. Unfortunately, plastic fabric is what almost everyone wears in our country.

"Synthetic Fabric" can lead to a lot of skin allergies and some time may end up in Cancer too. They trap the heat in our body and contain chemicals that harm our body. They end up as a pile of waste and are not recycled as making a new one costs much less than recycling an old one. Similar to other plastic items, it takes centuries for them to decompose. As a result, more landfills are created everyday that are full of Synthetic Fabrics.

Switching to Organic Fabric is very important to keep our bodies safe. Organic Fabric mainly consists of Cotton, Jute, Silk, Ramie or Wool; which are not harmful to skin and are decomposable.

Brands which are into Organic Fabric are FabIndia, Silk'n Fab, Innova Tex, Herbal fab and many more local brands in and around almost every metro city.

Prefer pure cotton-based fabric to nylon from the next time you go shopping!

### **Spread Love! (and used items too)**

All of us have a big stack of old clothes, electronics, chargers, dishes that we want to get rid of and end up throwing them! Don't throw away, Gift it to your friends, donate it to people who need it. There are a lot of NGOs which take cloth donations, etc. It's not difficult to find them.

If possible, Organize cloth donation camps in your neighbourhood, College or Office. NGOs like 'Goonj' take cloth donations and donate them to the needy.



A collection drive in progress

### ► **Sell stuff online**

If you have items which are in a usable state and your heart says not to donate them, then try sites like Quikr, ebay or OLX. They give an online platform to sellers, where they can post what they want to sell and a price. Buyers can select the item they want city-wise and things can be taken off from there. These sites even have a system of online bidding and you might actually find a reasonable price to sell that old thing which has been lingering since long.

### ► **Second-hand doesn't mean second-best**

Buy used items online from sites like ebay, OLX and Quikr. You are not only saving money, but also saving a lot of waste. Don't feel shy in taking used electronics from your friends or colleagues when they offer you. Buying Second hand doesn't mean you don't have the ability to buy a new one; it simply means you took a conscious decision of improving this planet.

## **Plant trees**

It's quite an obvious thing to do to go Green - Plant Trees! Plant trees in your neighbourhood, at school, college and encourage others to do so. Plant a

tree on every birthday and try to take care of that tree. You'll love planting trees and Gardening even before you know!

Plants have their own obvious advantages. They take in Carbon-Dioxide, reduce pollution and help in the reduction of Global Warming.

## Buy Local

Even before Independence Gandhi emphasized on this - "make local and buy local". That was of course to kick out the British. But now, that time has come again; we need to buy local stuff and start making more local stuff.

Buying a car from your place instead of getting it shipped, will save a huge amount of fuel that might have been wasted in the transportation. The same applies to grocery shopping too. Try to go to a local grocer to buy groceries instead of buying them from supermarket chains. In these supermarkets, the fruits/vegetables are picked up early after copious spraying of herbicide and pesticide, ripening in a truck on the way here, far from the nutritious and natural benefits of the sun. The local ones will be tasting better as they will be picked up from a local market and hence will have no preservatives. And local production means no emissions from driving, no energy consumption from shipping and storage and hence a very low carbon footprint. See how minor decisions can bring in a huge change!

## Green computing

The ICT industry is currently responsible for 3 per cent of energy consumption in the world. Taking into account the increasing rate of consumption, by 2030, the energy consumption of the world will be doubled because of the ICT industry

Taking into account the amount of PCs, Laptops, Cell phones that are used in day-to-day life and the amount that is being dumped; e-waste in India is a huge problem. Not more than 5 per cent of all the e-waste gets recycled.

Apart from all the e-waste that is produced in the country which is approximately calculated to be 4 lakh tonnes, India is a major importer of e-waste from countries all around the world. Tuticorin port, which is situated 600 kms south of Chennai in Tamil Nadu is heaped with 195 metric tonnes of e-waste imported from Malaysia, Singapore and Saudi Arabia. And this is only the legal calculated e-waste that has been imported with Government regulations. Ports of South India have become an illegal trash-can for all the countries.

This e-waste has a lot of hazardous chemicals mixed in them during their manufacturing. These don't get decomposed and are thrown in the landfills or left as piles. This e-waste creates a lot of health hazards to people who

work on recycling these electronic goods.



Loads of e-waste

With so much of e-waste being accumulated, we need to do something to reduce it. Nowadays, electronic items are “Designed For Dump”. They are designed to go bad in around 18 months of time and buying something new has become

more economical than repairing the old one. And new models keep getting updated every year. Take iPad series for example; before people could even buy iPad2 in India, the new iPad has arrived! A lot of previous generation devices like iPad1 are thrown away. This is creating a huge e-waste which has become unhandleable.

## What can we do?

Try maintaining your phone. Don't switch to a new one unless and until it is necessary. Gift your old phone, donate it to Nokia Center. Try to avoid increasing e-waste from your side.

## Green computing

Green computing is another alternative way to tackle this problem. This won't only decrease the amount of e-waste but will also make that e-waste degradable. Green computing embodies the entire life cycle of technologies, including research, manufacturing, use, and disposal. Green Computing aims at reducing the hazardous materials, maximise energy efficiency and promote recyclability.

Green computing aims at the following:

### 1. Manufacturing

A lot of toxic chemicals are involved in the manufacturing process of Electronic products. Some of them are:

- ▶ **Lead:** It is used in soldering the circuit boards. Lead can cause damage to the central and peripheral nervous system, blood system and kidneys.
- ▶ **Mercury:** it is used in batteries and switches. Methylated Mercury forms when Mercury spreads out in water and that can cause brain damage.
- ▶ **Cadmium:** It is used in resistors for chips and in semiconductors. Cadmium accumulates in the kidneys and are proved to be quite harmful.

## Green manufacturing

Green computing aims at using more eco-friendly materials during the manufacturing process of electronic products:

- ▶ **Bamboo:** It is used for making casings and computer peripherals.
- ▶ **Recyclable plastics:** Recyclable plastics are used instead of non-recyclable ones.
- ▶ **Eco-friendly Flame Retardants:** Silicon Compounds that are eco-friendly flame retardants and are non-toxic are used.
- ▶ **Inventory Management:** Green Computing tries to reduce the quantity of both hazardous and of excess raw materials that are used in the manufacturing process.

## 2. Energy consumption

Green computing aims to implement techniques to reduce energy consumption for efficient usage. Here are some simple things that you can follow to reduce energy consumption:

- ▶ Turn off your monitor when not in use and power down the CPU and other peripherals in extended periods of inactivity.
- ▶ Use LCD (Liquid-crystal-display) rather than CRT (Cathode-Ray-Tube) monitors.
- ▶ Use the power-management features to turn off hard drives and turn the computer to sleep after several minutes of inactivity.
- ▶ Try to opt for green batteries - manufactured with the techniques of Green Computing.
- ▶ Do not use air condition in the evenings. Open up the windows and let the cool breeze come in.
- ▶ Set your power settings to power-saving mode.
- ▶ Switch off non-useful background applications such as Bluetooth on your mobiles. They draw too much of battery.
- ▶ Try to use more of Green Laptops/PCs and printers. They are designed to consume lesser energy.



- ▶ If you hate turning off your PC and open all your applications again the next day; then, hibernate your system, it saves all your WIP and turns of.

### 3. Disposal

Green Computing aims at proper disposal of the e-waste according to the Government Laws and regulations. Presently, the e-waste is disposed in a very non-eco friendly way. As mentioned earlier, a lot of e-waste is imported to India and is being thrown in Landfills.

The toxic chemicals which are used during manufacturing get into the land and are released into the atmosphere. This causes a lot of health defects and pollution.

### Green disposal

- ▶ **Reuse:** Do not throw away your old electronics, but donate it or gift it to people who want them.
- ▶ **Refurbish:** Rather than discarding your computer, replace some old parts and upgrade it! This reduces the e-waste hugely.
- ▶ **Recycle:** The metals that are used in manufacturing process of electronics should be recycled and used in manufacturing again. If electronics are made from eco-friendly materials, they are biodegradable and won't create much pollution and e-waste.

## Digitise

Start digitising everything and minimise the use of paper.

### ▶ Travel with an e-ticket on mobile or tablet

With IRCTC giving an option of carrying ticket on mobile, travelling in India can be done with an e-ticket itself on all forms of transport. Try to avoid using a printed form of ticket from now on.

### ▶ Pay bills online

Stop paying bills by going to the bill counter. Paying bills online will save fuel and paper too!

### ► **Avoid printing**

Avoid printing e-mails, bank statements as far as possible. Try to find out alternate ways of e-documentation, if that's the problem.

### ► **Download software rather buying cds**

This will save the manufacturing of CDs and the fuel and energy involved in transporting and shipping the CDs. Download Softwares/games digitally instead.

## **Green your commute**

While it is important to maintain your vehicle so that you add less pollution to the environment, it is essential to understand how you can green your commute.

### ► **Switch to public transit**

Everyone using their own vehicles to travel daily are not only wasting a lot of fuel, but also are creating huge traffic jams and congestion in cities. That leads to more fuel loss and addition of huge amount of pollution in the air. Switching to Public transit is a little painful, but a good alternative. It is difficult in some cities where public transport is not that neat and tidy. But, if you consider cities like Delhi and Bangalore where Metro and Bus services are pretty decent, there is no excuse that you give to yourself for not traveling in public transits. Take your vehicle till the Metro, you can park it there, travel in the metro and pick your vehicle up on your way back. Advise you kids to take the school/college bus, instead of dropping them in your own vehicle. This will help them make better friends also! If almost everyone starts using the public transits to go to Offices, schools and colleges; there would be a 40 per cent reduction in the oil that is consumed in the country.



### ► **Carpool to work/college**

If using public transit is not possible due to long distance travels or loca-



tional problems, Carpooling is not a bad option. Try to Carpool with your neighbours while going to office, schools or colleges. This will also be quite lighter on your pockets when compared to traveling all by yourself. As a company, encourage your employees to use public transit or carpool to work.

Like, Ludhiana Beverages Private Limited (LBPL), the franchise bottling partners of Coca Cola in India, has announced unique awards for the employees to commemorate the World Environment Day. The awards will be given to the employees who commute by cycles or pool-share their vehicles to reach the office.

### ► **Use Bicycle**

If you don't have a bicycle and thought that it's a dead investment, we'd would say, think again; at least for the planet! Traveling on Bicycles for small distances can prove to be very useful in cutting down the pollution. For getting Groceries or going to a nearby house, traveling on a Bicycle will not only help in making you go Green, but will also help you in keeping yourself fit.

Many Universities in India and abroad like IITs follow the rule of traveling only on a Bicycle inside the campus. This helps in maintaining the campuses Green and non-pollutant.

In some countries like France, Bicycles are provided for hire at almost all parts of the city and people can use them to travel small distances and drop them whenever they finish their work. Encouraging people to travel on Bicycles and avoiding their motor vehicles can save a lot of fuel!

### ► **Think about Electric Vehicles**

Even though, the technology associated with the Electrical Vehicles is not much advanced and these vehicles cannot be still used to travel across cities, these can be handy to travel in a city. There are a few good Electrical



vehicles in the market; one of them being Mahindra Reva-i. It can be powered by small electric rechargeable lithium-ion motor that can be charged at your normal house socket. This can be an intelligent choice for travel within the city for a distance of about 80

kilometers. The main advantage of electric vehicles besides low pollution is that the running cost of an electric vehicle is much lower vis-à-vis a conventional vehicle.

As an Organization, give incentives to people who buy Electric vehicles. SAP India pays staff for green commute. They provide Reva buyers a car allowance, which encourages the staff to buy Electric operated vehicles.

### ► **Choose a place close to workplace**

Even though most of us try to get a living place close to workplace, sometimes it doesn't work out due to monetary constraints. But, choosing a place close-by can actually save a lot of time, effort and even money that would compensate those extra bucks you are paying to live close-by.

## **And Be Informed!**

If you want to make a sustainable environment, most of all Be Informed!,

Know where the water your city/neighbourhood uses actually come from. Water that is supplied to major cities like Mumbai, Chennai, Bangalore come from Lakes and Rivers that are very far away from the city. Because of this, the villages that exist nearby to those lakes face a lot of problems.

### ► **Calculate Carbon FootPrint**

Calculate your Carbon Footprint every week and try measures that could reduce it. Keep an aim to only decrease the carbon footprint value every week.

### ► **Subscribe to Green Magazines/blog**

This would keep you updated all the time about new steps that are being taken in this field and what more can you do to go Green. Following are some of the Internationally acclaimed Green Blogs/websites that are a must-follow:

TreeHugger, thedailygreen, green-blog.org, RecycleScene, Tiny Green Mom. These websites discuss over small things that you can do in your daily life to make a change!


Some of the Indian-based blogs/websites that might give you an insight are: Delhi Greens, Project Brahma, The New Ecologist.

### ► **Follow Documentaries, shows**

Watch Documentaries like "The Story Of Stuff" (<http://www.storyofstuff.org/>) by Annie Leonard, in which she gives a detailed insight into how the world

has slowly created and accepted the “Designed For Dump” pattern. Watch these documentaries with your family and friends; spread information and make this a debatable topic in your community and neighbourhood.

Encourage your kids or push yourself to create plays on this and try spreading the word as much as possible.

Follow shows like ‘Satyameva Jayate’ which deals about these issues. Suggest your friends to watch them. Being informed and spreading information is the only way that can make something big happen. So, start now! 



# BUYING RIGHT

Some gadgets are more eco-friendly than others. We help you choose the right ones

**T**he concept of “buying right” or buying eco friendly products and goods or in our case, gadgets is taking up root in the modern Indian customer. Not clued in yet? Fear not. When you are done with this article, (which admittedly may take a while) you shall be an expert on this subject. Let us start with the obvious.

### **What is an eco friendly or environment friendly product?**

Eco- friendly (also environment friendly, nature friendly or green) means earth friendly. It refers to products which contribute to green living or

practices that may help conserve things like water and energy. They prevent land, water and air pollution. They do not harm the environment whether in their production, use or disposal. By their usage, most of these products help conserve energy, minimize carbon footprint or the emission of green house gases at the same time and do not lead to an overall increase in the toxicity or pollution. Majority of these products are bio degradable, recyclable or can be composted. Hence, their disposal does not disturb the ecological balance. Many a times, they are made of recycled materials. Since the waste is being diverted to recycled products, there is a substantial decrease in the amount of waste sent to the landfills and incinerators. The demand for such recycled products leads to the completion of the recycling loop, thereby sustaining the recycling industry.

### Why buy these products?

Have you looked around lately? The rate at which we are consuming resources is staggering. We are producing goods, using and then discarding them at a break neck speed. If we don't switch to green products, we will soon



be surrounded by pollution and toxins caused by producing, using and disposing these non-green items. Since there would be no demand of recycled items, the recycling industry would come crashing down.

There would be a serious shortage of resources and energy, as much of the same would be wasted in driving energy inefficient equipment and producing new materials and products. Usage of eco-friendly products allows each and every one of us to decrease the negative effect we create by inhabiting this planet.

### How to tell if a product is environment friendly?

No, eco friendly products are not all green in color! In order to help customers identify genuinely eco-friendly products, various programs have been set up in collaboration with the respective governments to certify green manufacturers. Some programs use eco labels such as “Energy Star” and “Green Seal” to endorse such products. The “Energy Star” is an international standard for energy efficient consumer products. One such standard is the “Eco



Label” used in most of the European Union. The label used in Germany is called the “Blue Angel”. However not all labels are officially verified. Since there is no accepted definition for this concept, the International Organization for Standardization considers many of the labels to be too vague to be meaningful.

## Green Washing

A majority of customers are positively affected by the application of the eco friendly label to products. Companies sometimes take undue advantage of this fact by labeling their products “eco-friendly” or “environment-friendly” when they are in fact, not so. Called green washing, this tactic is perpetuated by marketing campaigns aimed to help increase the sales of the company by targeting the ecologically conscious buyers. To avoid purchasing such green washed products, one should look for products approved by groups like the Energy Star program or consumer advocacy groups like the Green Good Housekeeping Seal.

## The Good Samaritans

Not all companies have such deplorable records in terms of the environmental impact that they cause. There have been some companies over the years that have gone out of the way to incorporate sustainability and environment friendly practices into their culture even when the laws did not demand it. Now there are quite a few such companies but we will keep ourselves limited to the following companies for the purpose of illustration.

HP provides a large number of environmentally responsible recycling solutions in over 45 countries, regions and territories. It was among the first companies to begin electronic recycling back in 1987 and launched HP Planet Partners for return and reuse of laser cartridges in 1991 which continues to this date. Recycling of inkjet print cartridges was added in 1997. HP has recycled close to one billion pounds of hardware and print cartridges globally with an aggressive goal to reach two billion pounds soon.

HP Planet Partners enables the return and subsequent recycling of HP ink cartridges and laser jet supplies, any brand of computer hardware and rechargeable batteries. The returned products are



recycled to recover valuable plastics and metals for new products, diverting millions of tons of waste from landfills.

HP uses top quality recycling facilities to process each product which was returned through a multi- phase recycling process. No HP print cartridges passed through the recycling process are sent to landfill. The various products are sorted and shredded, then separated into plastic and metal. Residual chemicals are separated. Recovered plastic and metal materials are further processed into their raw form so that they may be used in various new HP products like cartridges, computers, automotive parts, microchip processing trays, etc. With technology developing at lighting fast pace, tons of obsolete computer hardware is being added to landfills worldwide. HP's computer hardware recycling service aims to cut down on the hardware wastage put the raw material to good use. This simple environmentally sound program allows customers and business users to return and recycle any brand of computer hardware. It provides high quality products that are environmentally sound- right from product design, through manufacturing and distribution, customer use and end of life.

Let's look at another company. Canon's green initiative "Generation Green" aims to reduce the environmental burden in all stages of a product life cycle. Generation Green is designed to provide business partners, customers and consumers a way to identify and learn about the various green products and solutions that Canon offers, for example, cost savings through energy efficiency. The aim is to create products that are considerate to the people and the global environment. Generation Green is focused on three main areas: Eco Conscious, Eco Standard and Eco friendly.



users conserve energy and reduce waste. Eco Standard aims to keep harmful chemicals out of the production and consumption low. Eco friendly aims to give customers a chance to get involved with the Canon recycling programs.

Canon started its toner recycling program in 1990 as per the Clean Earth Campaign. More than 200,000 tonnes of toner cartridge



has been recycled. The recycling facility was expanded to include hardware in 2004. Canon has several Eco Conscious features in its green line of printers. They include quick start, which aims to reduce the energy consumption. On Demand Surf Rapid Fixing is another new technology that was introduced which uses linear ceramic heater to heat the print quicker, resulting in reduction in energy consumption by 75 per cent. Canon has also reduced the size of the boxes it uses by about 25 per cent to increase efficiency of transport. Canon has started using new materials such as airshell packaging which reduces carbon dioxide emission during transport by 23 per cent. The Canon Forest Program was launched in 2008 under which for every 10 new and existing Generation Green products registered, Canon would plant a tree and offer its customers a chance to take part in several volunteer programs. Canon has further partnered with Arbor Day Foundation to plant over 100,000 trees over the past three years.

Dell has built its sustainability strategy over the years by setting challenging targets and then achieving them. In 2008, it was announced by Dell that it would cut down its emissions by 40 per cent by 2015 and the company is well on its way to achieve the target.



Dell's strategy is to reduce the environmental impact of its products at every stage of their life cycles, right from design to disposal. Compared to similar systems in 2005, the company's desktops and laptops are now built to consume 25 per cent less energy. This effort, among others has saved its customers more than 5 billion dollars in Energy consumption over the past few years. The company has further used more than 7 million pounds of recycled plastic to produce new products- the equivalent of recycling 263 million water bottles. Dell has the technology industry's more comprehensive recycling plan. It takes back and recycles any of its products for free and also takes products of competitors at no cost with purchase of dell computers or peripherals. In some countries, customers can also mail back old equipment and Dell may even pick up items from their homes.

Dell designs its products for recyclability. Products are designed for longevity with products, parts and components designed to be upgraded, extending the life of the product. It further increases the reuse value of the product. The products are designed for recyclability so that when the product finally does reach its end of life, it is easy to disassemble and process. To make the products recyclable there is a focus on the type of products used, how they are put together and the kind of labelling used. For example, the exterior of a range of laptops was made using polymer reinforced carbon fibers which make the laptop lightweight and cool to

touch. The material was further confirmed to various standards of recyclability so that it could be used again.

Apart from the usage of recyclable and reusable materials for development of products, there is huge focus on making the packaging highly eco friendly using renewable and recyclable materials such as mushrooms and bamboo. Recycled content material is also heavily used to



further the overall recycling cycle. There is focus on modularity of the products as well. Almost all the components in the Dell products are easily removable and have standardized parts. This makes it easier to reuse and recycle them. By smart designing, the number of screws in Dell products has been reduced significantly and those that still exist are of similar sizes. The entire product can be disassembled with common tools. Usage of glues and adhesives has been reduced as they pose a challenge in implementing reusability. Instead snap fits are used to affect the same design goals. Integral finishes are used instead of exterior coating which can interfere with recycling and also degrades the plastic reducing its life cycle. When paint is the only viable option, then it is used with confirmation to various recycling codes. Dell partners with a number of non-governmental organizations around the world to help address various environmental issues. To offset its direct greenhouse gas emissions and business air travel emissions Dell partners with Conservation International on a forest and habitat preservation initiative with the Republic of Madagascar. Dell is developing nearly

500,000 acres of forest land in this area to prevent 500,000 tons of carbon dioxide that would be released in the next 5 years. That is the equivalent of Dell's onsite carbon emission and business air travel emission. Dell believes in zero waste- producing, consuming and recycling, without throwing anything away. It has achieved a reuse and recycle rate of about 98 per cent. Its major facilities around the world have an onsite recycling program. In 2009, Dell became the first in the industry to ban the export of non working electronics to developing countries.

## What are the various certifications and standards?

**Energy Star:** Energy Star is an international standard for energy efficient consumer products originated in USA. It was created in 1992 by the Environmental Protection Agency and the Department of Energy. Since then, many countries like India, Australia, Canada, Japan and the European Union have accepted it. Devices carrying the Energy Star service mark such as computer products and peripherals, kitchen appliances, buildings, heating and cooling systems, lighting and other products generally use 20-30 per cent less energy than required by federal standards. The specifications vary with each product and are available for a variety of goods. Energy guide ratings for appliances will show their usage in Kilo watt- hour per year, the lower the energy number the more cost efficient it is to run. The ratings will grade equipments/ buildings on their energy efficiency, starting with 1 star for the least energy efficient and 5 stars for the most energy efficient. Star labels have been created to standardize the energy efficiency ratings of different electrical appliances and indicate consumption of energy under standard conditions.



**BEE:** The Bureau of Energy Efficiency is an agency of the Government of India under the provision of the Energy Conservation Act 2001. The agency's function is to develop programs which aim to increase energy conservation and its efficient use. In May 2006, the Bureau of Energy Efficiency launched a standards and labeling program for home appliances. Manufacturers of home appliances could choose to affix BEE star

labels to guide consumers while buying appliances. The label indicates the level of the energy consumption of the device in two ways- absolute value stating, which is the average number of electrical units that would be used by the appliance or use the star rating system. The star ratings range from one to five. The more the number of stars, the more energy efficient the appliance is.

BEE labels indicate higher efficiency of functioning in appliances. It allows customers to buy quality products that function well at the same time saving electricity costs. For Example, A star 1 AC tends to cost INR 3500 more than a star 2 AC over a period of 5 years in electricity bills at current rates. On the other hand a 5 star AC tends to save INR 7800 as compared to the 2 star over a 5 year period. The Government has made it mandatory for all appliances to have ratings by BEE starting in 2010.

**EU Energy label:** EU established an energy consumption labeling scheme called the EU Energy label. This directive along with several other directives made it mandatory that most white goods, lighting equipment and

cars must have EU Energy label displayed prominently when offered for sale or rent. Energy efficiency classes from A to G are mentioned on the labels as ratings of appliances with A being the most energy efficient and G being the least. The labels also give other useful information to the customers as they chose between different products. The information is further required to be mentioned on catalogues and included on web sites. A+, A++ and A+++ grades were introduced later for rating different products.



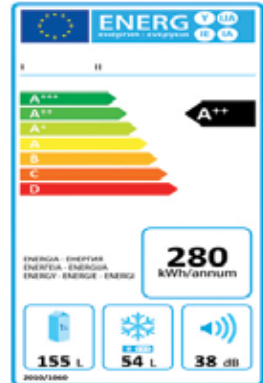
In order to allow manufacturers to use a single label in multiple countries in the European Union, words were replaced by pictographic labels. Labeling is separated into different categories based on the appliances' details, including specific model and materials details, energy class (rating A to G), consumption, efficiency and finally the amount of noise emitted. The label applies to various appliances like washing machine, air conditioners, ovens, dish washers, refrigerators, light bulbs, televisions and cars.

**EPEAT:** The Electronic Product Environment Assessment Tool is a method for customers to evaluate the effect of a product on the environment. It assesses life cycle environmental impact and ranks products as bronze, silver or gold based on a set of environmental performance criterion.

EPEAT is managed by the Green Economic Council which is a program of International Sustainability Development Foundation. To identify products as EPEAT bronze, silver or gold the organization has signed an MOU with a group of technical and environmental assessment organizations. Computing equipments are evaluated on 53 criteria, some mandatory and some optional, that measure the efficiency and sustainability of products. Products are rated bronze, silver and gold on the basis of how many optional criteria they meet. Since 2010, Amazon began using EPEAT criteria on its website to identify greener electronic products.

## Eco- Buying Guide

There are several guides available online which list out criterion to be considered for buying various environmental friendly products. Here we provide some criterion for buying laptops the green way.



- ▶ Evaluate your needs- First of all, do you really need that new laptop? If not, then don't buy it. Not even if it is the latest sleek model with that uber-cool interface.
- ▶ If yes, then try and figure out what you need it for. This will help you purchase the most efficient laptop for your use. If you are a casual user and need to use it for simple tasks like checking mail, surfing the web then look at notebooks or tablet computers which are not only cheaper but also use lesser energy. A tablet could further eliminate the need of an e- reader.
- ▶ If you plan to use the laptop in extreme conditions, damp climate, high temperature, or more or less any part of India, then go for a sturdy laptop as that will last longer.
- ▶ Add-ons like extra memory, blu-ray drive, extra RAM, etc. should be ordered with the laptop itself, rather than ordering it separately. This will reduce the carbon footprint by removing the material and energy costs associated with ordering, shipping and installing.
- ▶ Try to look for low power components. With the trend of making more power efficient computers taking hold of the computer industry, low power components are increasingly becoming more available. Solid state drives are one example. While costlier than your run of the mill

hard drive, they are sturdier, faster and consume lesser power. Several companies now offer products with low power chips. Chips are the major source of power consumption in a laptop. Hence any reduction in their power consumption brings immediate savings of energy.

The current production, usage and disposal practices being employed are doing no good for the environment. We are burning through amazing amounts of material and churning corresponding amounts of junk. With the total amount of resources on the planet being finite, it is but obvious that we are bound to reach an end some day. The end, as of now, seems to be us sitting on a pile of garbage.




It is consumption that drives the economies in major countries around the world and more so in India. To bring any sort of change in the status quo requires a major upheaval of our consumption or buying practices. Consumption in a sustainable manner would drive up a demand which lead to the production of more such products

and services, thereby providing the much needed impetus to bring about the change. Buying right, therefore acquires paramount importance in the scheme of things.

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# DISPOSING RIGHT

In the previous chapter we saw how we can buy the right eco-friendly products, here we will understand the correct steps to take to dispose of them at the end of their life cycle

**I**n today's day and age, an unfortunate offshoot of consumerism is that tons of products, including gadgets, electronics and other everyday equipment gets discarded on a regular basis. We are constantly on the lookout for better gadgets, faster components, and routinely dis-



card the products that once served us well but now are at the end of their lifecycle and no use to us.

The normal way of doing things involves calling the local kabadiwala or scrap dealer and giving off that old monitor, keyboard or washing machine that you no longer require. He in turn gives you some cash for it. We're not talking bundles of moolah here. It's usually the value of the metal used in the electronics by weight. You accept a few hundred rupees and forget about it. Ever wonder what happens to this e-waste once it's off your hands and out of your mind? There's more to this story than meets the eye. The waste changes a few hands and lands up at a scrapyards with lots of other discarded electronic goods. "That's not so bad", you might be thinking. But what happens to these goods after this point is the troubling bit. Gangs of unskilled, street urchins get down to work on these goods. They melt these components using methods that add smoke, toxins and alarmingly large amounts of greenhouse gasses to the environment. Not only that, the workers expose themselves to arsenic compounds that in many cases leave lasting damage. Shocking isn't it?

In a recent study published by the Associated Chambers of Commerce and Industry (ASSOCHAM) it revealed that just 4.5 percent of India's e-waste gets recycled. Furthermore India currently produces a staggering 4.4 lakh tons of e-waste annually! About 70 percent of this e-waste is computer equipment, telecom gadgets account for 12 percent and the rest includes, medical tools and household e-scrap. When such large quantities of goods are broken down using unskilled labour, non-standardised and unregulated extraction methods you can only imagine the kind of negative effect it has on the environment.



According to the E-waste Management and Handling Rules that were formalised in May 2011, it became compulsory for consumers to hand over discarded electronic waste to designated collectors for proper disposal. This means that you can't simply toss that old cordless or cellphone into the bin. The rules further asked local governments to set up collection and disposal mechanisms for this purpose. The rules also made it mandatory for producers, under the extended producer responsibility, (which you will learn more about in Chapter 10) to take back e-waste for recycling. Prior to these rules the situation was abysmal. Back in 2007 Greenpeace did an Assessment of e-waste take back in India and found that 9 of the 20 brands surveyed for their takeback practice in India have no takeback service. Since then companies at least seem to have improved. Nokia for instance announces proudly on their website "In 2011 alone, we collected over 60 tons of phones and accessories through our own campaigns in India."

But there is only so much organisations can do. The change should come from within and from the masses. While disposing e-waste at an individual level the thumb rule of reduce, reuse, and recycle applies. Here are some steps you can take to ensure proper disposal of e-waste:

## Reduce

This is perhaps the most difficult step in this three point program. Curbing your wants goes against the very nature of human desires. But think about it for a second. Did you really need half those purchases you made in the past year? Perhaps you could've done without that MP3 player, which is now gathering dust in your drawer. Maybe you don't need that 3D TV which everyone and their uncle seems to be harping on about. You have a 32 inch plasma at home will you really watch 3D movies wearing those dorky glasses? Each of your purchases can be evaluated in such a fashion and you will be on your way to reducing your hand in the country's e-waste production.

## Reuse

There are lots of ways in which your old computers can be put to some good use. Re-using is a good way to prolong the life-cycle of a product. Just because you consider a particular piece of equipment to be obsolete and no use does not mean that there isn't someone, somewhere who would be glad to use it for a few more years. The best way is to donate it to a needy organisation. There are several organisations that accept old PCs from you.



While it is difficult to individually find such organisations there is always a work around. <http://donateyourpc.in> for example is a service that tries to bring together Indian PC and computer peripheral donors with NGOs/ Schools and people who need such computers for education and empowerment. If you wish to donate your old PC, simply register your donation details on this site and when a needy NGO requires your PC, you will be contacted. However before doing this there are some guidelines that you should follow. Before donating your computer please ensure that it is in working order. Understandably these NGOs do not have the expertise or requisite monetary resources to fix up PCs that are not in working order. Make sure all the peripherals are in working order as well. It's best if such PCs have some form of opensource operating system or office application installed. If you have paid software ensure that you transfer all necessary licensing documentation, warranties etc. Also, some organisations will give clear minimum config requirements. Decide to give your PC only if it meets these requirements.

## Recycle

This bit is a little more tedious than the previous steps but for non-functioning products this is the best way. As we mentioned at the start of the chapter we need to go out of the mindset of getting scrap value for our old



non-functioning gadgets. To dispose off gadgets in an environmentally sound way you need to ensure you are giving it to the right dismantler. All you have to do is look at the website of electronics brand from whom you have purchased the product and locate the collection center near you. With the Draft E-waste (Management and Handling) Rules coming into the picture, most of these manufacturers have started providing support for proper disposal of their own e-waste. For instance here is the link to Samsung's take back map: <http://dgit.in/PGDyqI> which lists all of Samsung's take back centers where you can drop off your old gadget for proper disposal. If you cannot find the company's collection center location or they do not have one, you can find companies registered with MOEF/CPCB as recyclers/reprocessors at the following link: <http://dgit.in/NboGRj> These guys are supposed to dispose off / recycle / refurbish old electronic products in government approved methods so as to cause least amount of ecological impact. On an institutional level there are companies such as EcoReco working towards safe disposal and recycling of e-waste. Ecoreco provides e-waste management right from collection of e-waste from the door step of the generators, transporting, sorting them into working / non-working equipments / components, secured data destruction, dismantling of end of life equipments, size reduction, sorting in to different commodities like glass,

plastic, iron / steel, aluminum, copper and other fractions, remarketing of reusable equipment, components and various recovered commodities as well as disposal of hazardous substances as per the prescribed Rules.

**Further reading:****Where does waste end up?**

An interesting data visualisation that shows the world's favourite dumping yards - Asia and Africa. <http://dgit.in/QroRUI>

**Greenpeace Guide to Greener Electronics**

A detailed comparison of which companies rank higher on the eco-scale <http://dgit.in/PZwS92> 



# GOVERNMENT'S GREEN POLICY

The government has put in place certain laws to help save the environment. Read on for a complete lowdown

**T**he 'Bottle Bills' of the 70's and the 80's began what today is called 'Extended Producer Responsibility (EPR) or also called 'Product Stewardship'. It started with the soft drink and beer manufacturing companies who had to take the responsibility of their packaging (bottles) and take them back to be reused or recycled. By adding the cost of the product to its entire life cycle and beyond, product

designers were forced to bring out products with easily reusable materials or degradable materials which would ultimately make less of a negative impact on the environment. When the manufacturer is made responsible for the disposal of his product he has to find ways in which the product is easily disposed, once the product is out of use and more importantly ways of manufacturing the same product using easily degradable or reusable materials. Did you know 20% every product can be recycled? The concept of EPR was first introduced in Sweden in the 90's and Wikipedia defines it "[EPR] is an environmental protection strategy to reach an environmental objective of a decreased total environmental impact of a product, by making the manufacturer of the product responsible for the entire life-cycle of the product and especially for the take-back, recycling and final disposal of the product."

E-waste is discarded computers, office electronic equipment, entertainment device electronics, mobile phones, television sets etc., thousands of hazardous and non-hazardous ingredients found in electronic and electrical gadgets that we use daily and which become a problem once the usefulness of the gadget gets over, have to be dealt with. Cathode Ray Tubes (CRT) display equipment in computers etc. is the hardest to dispose or recycle because of the high lead content and phosphors present in them. Hazardous ingredients are elements like lead, mercury, arsenic, cadmium, chromium and selenium, such e-waste cannot be subjected to incineration and does not degrade easily and needs special attention.

The rising mounds of e-waste in landfills around the country the hazardous nature of most of such waste and International trends regarding management of e-waste brought about the Indian Government's Green Policy regarding such waste within the 'The Ministry of Forest and Environment Act'



of June 2011. This act came into effect from May 2012. As is usual the government published the draft rules for e-waste management in the Gazette of India under the Ministry for Environment and Forests in May 2011 inviting objections and suggestions from all persons likely to be affected, within 60 days after the publication of the draft rules.

The rules called the e-waste (Management and Handling) Rules came into effect from 1st May 2012. These rules apply to every producer, consumer, bulk consumer of electrical and electronic goods involved in the sale, manufacture, purchase and processing and also to the collection centre, dismantler and recycler of e-waste but not applicable to batteries, small and micro enterprises and radioactive waste. These rules of e-waste management of the Government facilitate the right handling and disposal of such waste, defining the role of all involved in detail. As is the case with such 'rules' the definition of each party involved is precisely spelt out so that the responsibilities are clearly understood by everyone involved. . The rules also spell out the procedure seeking authorization and registration





for handling of e-waste, the power to cancel an authorization, procedure for registration with the State Pollution Control Board, and the procedure for reduction of the use of hazardous substances in the manufacture of electrical and electronic equipment. The rules specify that: every producer of electrical and electronic equipment shall ensure that, new electrical or electronic equipment does not contain lead, mercury, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers, provided that a maximum concentration value of 0.1% by weight in homogenous materials for the above mentioned substances and 0.01% by weight in homogenous materials for cadmium shall be permitted. The duties of the authorities, the necessity of an annual report, the transportation of e-waste and the categories of electrical and electronic equipment covered under the rules and the application formats and forms for applying for authorization in all aspects of dealing with e-waste are mentioned. The rules as mentioned earlier define the meaning of various words used and the responsibilities of the parties therein.

A 'Producer' means any person, irrespective of the selling technique used, manufactures and offers to sell electrical and electronic equipment under his own brand or offers to sell under his own brand, assembled equipment produced by other manufacturers and suppliers or offers to sell imported equipment.

The responsibilities of the 'producer' are the collection of the e-waste generated during the process of manufacture and channelizing it for recycling or disposal, collection of the e-waste generated from the 'end life' of their products in line with the principle of 'Extended Producer Responsibility' and send it to a registered 'dismantler' or recycler and ensure this by authorizing collection agencies. Setting up collection centres or take back systems either individually or collectively and financing and organizing to meet the costs involved in the sound management of the e-waste generated from the 'end life' of its own products and historical waste available from the date from which these rules came into force, the financing arrangement has to be transparent whether established individually or collectively as the case may be. According to the rules, the producer also has to provide contact details such as addresses/telephone numbers/helpline numbers of authorized collection centres to all consumers. Responsibilities also include creating awareness through the media and information booklets with the equipment, information on hazardous constituents, hazards of improper handling, accidental breakage or improper recycling, instruc-

tions for handling equipment after its use along with Do's and Don'ts, affixing visible, legible and inedible symbol given below on products or information booklets to prevent e-waste from being dropped in garbage bins, obtaining authorization from State Pollution Control Board, or Committee in accordance with procedure. He has to also maintain records and make them available to the government.

'Collection Centre' means a centre established, individually or jointly or a registered society or a designated agency or a company or an association to collect e-waste. Responsibilities of such a centre will be to provide details such as address/telephone number/email etc. to the general public after obtaining permission from State Pollution Control Board or Committee, ensure that the e-waste collected by them is stored in a secured manner till sent to registered dismantlers or recyclers, ensure no damage is done to the environment during storage and transportation, file annual returns, and maintain records of e-waste handled and make them available to the government as and when required.

'Bulk Consumer' means bulk users of electrical or electronic equipment such as Central or State Government departments, Public Sector undertakings, Banks, Educational Institutions, Multinational organizations, international agencies and factories registered under the factories act (1948) and the companies act (1956). Their responsibilities are to ensure that e-waste generated by them is channelised to authorised collection centres, registered





dismantlers or recyclers or to provide take back services provided by the producers, maintain records of e-waste generated by them and make them available to the government as and when required.

‘Dismantler’ means any person or registered society or a designated company, agency or association engaged in the dismantling of used electrical or electronic equipment into their components. Their responsibilities are to obtain authorization, ensure no damage is caused to the environment during storage and transportation of e-waste, ensure the dismantling process does not have an adverse effect on health and environment, stick to standards and guidelines published by the government, segregation of dismantled parts and sending them to registered recyclers, ensure that non-recyclable materials are sent to authorized storage and disposal facilities, file annual returns, and not process any e-waste for recovery or refining of material unless he is registered.

'Recycler' means any person engaged in the recycling or reprocessing of electrical or electronics equipment or assemblies or their components, their responsibilities are to obtain authorization, registration, ensure recycling is according to standards and guidelines laid down by the government and make available all records as and when required, ensure residue generated is disposed of in a hazardous waste disposal facility and file annual returns.


By formalising these rules the government seeks to make a positive impact on the e-waste management scenario and we, as citizens can also positively contribute to this effort. Many initiatives to manage e-waste have been started in the country by the government as well as non-government agencies. The Karnataka Pollution Control Board has backed an Indo-German initiative to manage e-waste in Bangalore city called E-Parisara which has agreements with manufacturers to collect their e-waste and bring it to their processing facility at 'Dobbespel' in the outskirts of Bangalore where the waste is dismantled and sorted. A Delhi-based company has launched the country's first helpline dedicated to safe and environment-friendly disposal and recycling of e-waste. Toll-free telephone number is provided to get e-waste picked up from home and recycled. The Maharashtra State Government is also starting a plant for scientific recycling e-waste generated in the region. There are hundreds of companies who specialize in handling e-waste and if we are bulk consumer or even just a home user these companies help us to dispose of e-waste in a safe and profitable manner. 

Image courtesy: newyorker.com



# WHY GOING GREEN MAY BE BAD FOR THE ENVIRONMENT

From the outset, we would clarify that in an ideal world, going green cannot possibly be bad for the environment. Almost the entire premise of this piece is in the fallacy of the human mind

The idea is revolting, but true all the same. Yes, through some crazy means of working of this Universe, people turning green might still, in some way, be harming the environment. The reasons are, it turns out, purely psychological. The human race suffers from a rare chronic condition. We are prone to incessantly patting our backs in the event of having committed the slightest act of virtue/kindness/anything-that-would-supposedly-up-our-karma. Of course, you realize that the 'patting on the backs' was a simile, and might denote anything from a night of unlimited booze, to something much more serious than that. And it is that serious part that concerns us. At our core, we happen to be pretentious procrastinators, who wouldn't stop patting ourselves in the back for that one pinch of goodness that we'd once-upon-a-time come up with. No kidding.



The Earth probably doesn't need our help with that

Studies show that green tekkers are more likely to induce over-consumption among their adopters. You might not take our word for it (though you should), and that is what prompts us to cite examples in this regard.

At the University of California, Berkeley, studies were carried out, and it was concluded that once people got themselves that latest 'efficient' piece of gadgetry, their tendency to use it increased manifold. Further studies show that people, would be more careless in leaving energy-efficient lights on longer. It is just too easy, while thinking that you're doing your bit, isn't it?

Then there are things that you cannot possibly hope to have control over. In economics, it's called the law of 'diminishing marginal utility'. It states that the first glass of water you have will have a huge effect in quenching your thirst. The second will help a little less and so on. By the 10th glass you will be feeling unpleasantly full or even sick. That's the worst aspect: some major environmental policies aren't just ineffective -- they are counterproductive.

Another big reason is the business minded attitude that most people bring to the table here. They expect to see 'returns' on their 'investment' on the green dream. There is just one problem in that mental model - environmental friendliness is a way of life, it is definitely not your friendly neighbourhood hedge fund. Shelton Group, which advocates for sustainable consumer choices, carried out a study showing that of 500 people who had greened their homes, a third saw no reduction in their initial bills. That,

of course, serves to take the wind out of people's 'green drive', and they jump ship as quickly as they boarded it.

"Subconsciously, I think this is just part of human nature," said Jason Holstine, owner of Amicus Green Building Center in the Kensington. "It's like, 'If I just do a little, I'm off the hook and my conscious is clear. Give me a pat on the back, and thank you very much.' Then it goes too far."

"They think, 'I'm being a good person, I can do more of this stuff and still come out ahead,' " said Frank Zeman, director of the Center for Metropolitan Sustainability at New York Institute of Technology. "Although the problem is that they will never come out ahead. This goes to the heart of the sustainability challenge."

Finally, there is one important consideration. The fact that we need to go green hasn't been confirmed, as of yet. Scientists have claimed that the earth might well be going through a phase of natural climatic shift, which seems to have followed cycles of warm and hot throughout known history. The last known era was of a cold age, so it was by natural progression that the next one turns out to be hot. You can't say that the neanderthals and the woolly mammoths brought about the ice age, can you? We might be similarly guilt-free for the current changes that are beginning to show around us. "Well, it can't hurt, can it? Going green?" you ask. As it turns out, it can. Not coming from you, no sir. You carry on. It will hurt when it is done by the powers that be. Studies show that going green is one of the largest (and fastest growing) expenses among the developed nations. That means, all of the money, time and effort that we're putting in to 'save our planet', we might



Think green



Is it really necessary?

find that the planet was just trolling us all along, and was simply going through its motions, some of which apparently include a slight change in the earth's weather.

All of this just goes on to show that if you choose to go green,

then it cannot be ‘a part of your day’. It has to become a part of you, a part of what you are, how you think, how you live, everything. Because you cannot think green until green is the only way you think.


So there you have it. We’ve gone so far to make a point, and contradicted ourselves all along the way. Going green will never be bad for the environment. By definition, it cannot be, because the idea emerged because



Now here's a motto that just cannot go wrong

some people wanted to be good to the environment, and wanted to spread awareness so that others did it too. All of that is well and good. And proven. Any step that you take that falls under the ‘green’ category, will go into making a difference towards bettering our surroundings. None of that can ever be detrimental. But what comes after that is what contributes to the downfall here. That feeling of having been so good to the world around you, that you ‘deserve’ to be allowed more leeway when you’re bad. Absolute hogwash,

if there ever was one. This defeats the entire purpose of it! If going green is a karma count, you don’t have to balance your positive with your negative. Now, every time you do commit to a green adultery of this kind, God probably does not kill a kitten. But, all kittens would die, as would you and me, if the self-destructive path that we’ve been on, goes on. Please, be good. Be green. Don’t do it for yourself. Don’t do it for us. Do it for the kittens. Please, do it for the kittens.

The final word is really just one word. A compound word, if you must be all nerdy about it, but a single word nonetheless. Self-containment. So, you saved a tree. Big deal. Get over yourself. 





# WORTHWHILE GREEN TECH INITIATIVES

Moving away from fossil fuels, a look  
at our endeavour for clean energy

A lot of multinational companies and superpowers are convinced that the world's fossil fuels deposits are fast running dry, and a global energy crisis is looming on the horizon. It's not quite here but experts from a variety of fields agree that its inevitable and only a matter of time. We have no choice but to look for alternative, renewable fuel to take satiate our energy needs. Plenty of research on that front is going on around the world, and here we take a look at interesting

green tech examples and projects that can help usher in a brighter future for this planet and its inhabitants in the coming years.

## Green initiatives around the world

The looming energy crisis is a global problem, and if not tackled it will have repercussions for everyone around the world. With that in mind, let's take a look at some noteworthy initiatives around the world that we are looking for

### 1) The Green Grid

The Green Grid is a non-profit organization that stresses on IT companies to become greener and more efficient. It explains itself as, "With more than 175 member companies around the world, The Green Grid seeks to unite global industry efforts, create a common set of metrics, and develop technical resources and educational tools to further its goals." The initiative seeks collaboration between multiple companies towards better energy practices.

Participating IT companies work towards the shift to solar energy, enhancing data center efficiency and other green policy implementations across their offices to minimize their carbon footprint and cause minimal harm to the ecosystem.

### 2) Google's initiatives

Google's probably one of the most pro-active IT company in the field of greener tech research, adoption and deployment. It's working on renewable energy efforts not for its own offices alone, but investing plenty of money in developing large scale rooftop wind and solar panel installations which can produce up to 1.7GW of power, enough to power 350,000 US homes, Google claims.

Along with this, Google also has some product-level examples. It has an interesting chart on how emails hosted on Gmails servers (essentially in the cloud) consume less energy than emails hosted on a local server (in an office setup, for instance), simply because emails hosted on the cloud are across several data centers which are much more efficiently managed than a local server.

For more information on Google's green initiatives, visit [www.google.com/green/bigpicture](http://www.google.com/green/bigpicture)

### 3) Off-the-grid

This is an innovative American trend that's steadily evolving into a global movement. Off-the-grid simply means not connected to the grid or conven-

tional source of electricity or power, that your home or office generates its own renewable power through green initiatives. Back in 2006, USA Today reported that close to 200,000 American families were living off-the-grid. Since then, the trend has attracted steady global interest, and there's a Bollywood actress who recently converted her home to off-the-grid. Gul Panag destroyed her ancestral home to create fully modern, green, self-contained house that generates its own electricity and conducts rain-water harvesting. For anyone interested in going the green way for their household, they can approach GRIHA or Green Rating for Integrated Habitat Assessment (<http://www.grihindia.org/>), the national rating system in India.

## What's happening in India

India being a lucrative market in the energy sector, a lot is happening in India as far as green initiatives go. As you may know, the Indian government has also set itself the target of producing a minimum of 22 gigawatts or 22,000 megawatts of solar power by 2022 -- the maximum target is to reach 72 gigawatts of solar power by that time. An ambitious target, but one that many industry watchdogs and experts think the country will achieve. Let's take a closer look at some initiatives that are setting the tone for this new green revolution.

### Gujarat's canal-top solar power project

In a moment of great national and state pride, Narendra Modi, chief minister of the state of Gujarat allowed himself a smile, as he stood amidst endless rows of solar panels. The occasion to celebrate was the inauguration of the world's first canal-top solar power project built on one of the branches of the Narmada river canal network. This ambitious project, first of its kind in the world, would add 1 MW of power to the national grid.

Another advantage of deploying solar power projects of this kind, built or suspended over rivers or canals, is the amount of land that can be saved from solar panel fields. In the case of the Gujarat



canal-top solar project, one report suggests that the trial run (held in April earlier this year) produced 15 per cent more power as compared to solar panels deployed over land installations, because the water flowing under the panels in the canal down below helped keep the panels cool. The 1MW leg of the canal-top solar power installation, built by a US company, cost only Rs. 17.5 crores. It's projected to generate and provide 1.6 million units of power annually and at the same time reduce evaporation of 9 million litres of water flowing underneath. What better way to create clean, sustainable energy and eliminate the dependence on coal?

Earlier this year, Gujarat also switched on its solar park, the largest array of photovoltaic cells deployed anywhere in the world, which generates 600 MW of clean energy annually -- generating the same amount of energy conventionally would've required 7.5 lakh tonnes of coal and several hundred crores of capital. Clearly, Gujarat has set an example for the other states of India, showing the nation a way to successfully deploy and harvest solar energy in new ways.

## **Sustainable Technologies and Environmental Projects**

Based in Mumbai, STEPS or Sustainable Technologies and Environmental Projects is an effort to find innovative, greener solutions to tackle India and the world's energy problems. In their own words, waste is energy. As early as January this year, the group announced its intentions to launch a plant that converts plastic waste into a lighter form of diesel. The company has won the Lockheed Martin Innovations Award three times for succeeding to convert algae into diesel.

Diesel extracted through this process can be used in generators, and also refined to petrol and kerosene stage. Reports claim that the stuff can also be purified for use as aviation turbine fuel. STEPS' technology is already at work in a pilot project sanctioned by Mumbai city's municipal corporation. According to a report, the company is considering several joint ventures in this field in countries like Netherlands, Germany, Spain and the US.

Though not exactly green in the conventional sense, it's still an excellent example of salvaging industrial and domestic waste for our energy needs.

## **IBM GreenTech Initiative**

Among the corporates, an IT brand as old as the industry itself is leading the charge in finding cleaner, greener energy alternatives. And when you think of green initiatives, powering data centers through solar arrays isn't



the first thing that comes to mind. But that's the task IBM India's equipped themselves with.

Part of IBM's GreenTech initiative, the IT software and solutions giant has utilized open building terraces at its India Software Lab situated in Bangalore. Spread across an area of approximately 6,000 square feet, the solar array assembled on IBM's rooftops is capable of generating close to 50 KW of power for 330 days in a year for approximately five hours a day. That's a considerable amount given the power outages in Bangalore. IBM also claims that power generated through these solar arrays has machinery in place to provide current to both AC or DC server types, and that it's bringing down a data center's power consumption by 10 per cent when compared to any other solar installation.

With this unique deployment of solar arrays on rooftops, coupled with water coolers, IBM hopes to connect far-flung remote locations in India and around the world to the Internet, something they could never do on their own or soon enough. IBM also said that it can attach batteries to the solar arrays to store charge in areas which have absolutely no electricity. IBM hopes to deploy this all-in-one solar power system in remote locations very soon.


## Green practices at the Taj Hotels and Resorts

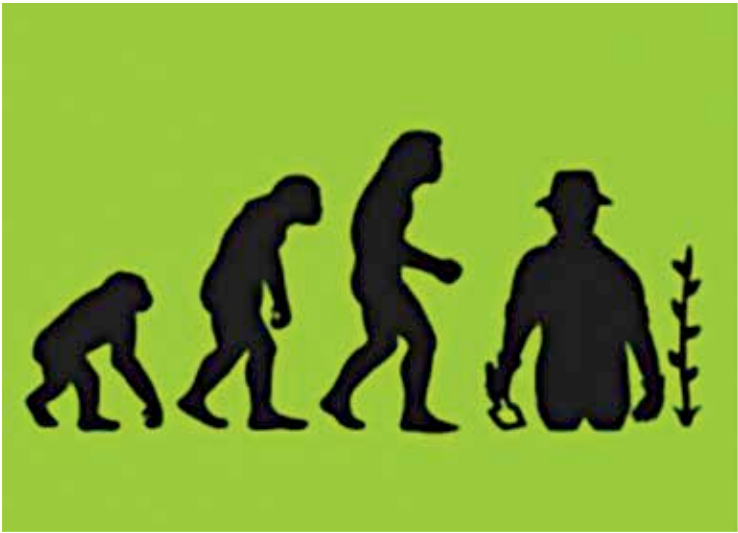
It's great to learn that green tech and clean energy initiatives aren't confined to one particular sector or industry at large. Because signs of a healthy, universal trend is when it finds widespread acceptability and adoption. Doing its bit for the environment is Taj Hotels and Resorts, an old name in India's hospitality sector and part of Tata Group, one of the largest company in India.

It's heartening to see that Taj Hotels and Resorts take green initiatives similar to servicing their guests and make them feel at home. Very few people know this but since 2010 the Taj group of hotels and resorts conform to green practices decreed by the Green Globe Standard (<http://dgit.in/O3GUIW>). This includes greener initiatives for waste management, conserving energy and eco-sensitivity assessed by an independent audit every three years.

Kitchen waste and dry leaves from the hotels is converted into compost and waste paper is recycled for writing pads. Not only do all Taj hotels use CFL lights, which consume close to 80 per cent less energy than incandescent bulbs, there are a few special cases of advanced green initiatives. According to a report, the Taj Coromandel in Chennai generates considerable energy through windmills, while Taj West End in Bangalore's solar water heating systems has helped save over 51,000 litres of fuel in the past three years. Taj's hotel at Rambagh Palace, Jaipur has a fully-functional biogas plant.

## Moser Baer's solar arm

We've all held a Moser Baer CD or DVD in our hand at some point of our life, haven't we? Yet, very few people know that Moser Baer's an Indian brand, even fewer know that it has a dedicated arm developing photovoltaic silicon cells since 2007. Surprised? So were we. Since its inception, the company has achieved several milestones and successfully completed solar array installations in a variety of countries across the world. Although it's fighting stiff competition from Chinese and American manufacturers in an emerging energy sector, it's great to know about a household name that should, if it weather's the storm, provide photovoltaic cells needed for solar panels at an affordable cost, thereby boosting the widespread acceptability of solar energy initiatives. 



# CHRONOLOGY OF THE GREEN MOVEMENT

Your faithful mythbusters, we tell you how going green cannot be the best thing since sliced bread – because it is older than sliced bread

Going green seems to be a very modern buzzword around. Which is why, it is mostly the upper echelons of the society that are expected to be on the bandwagon, and it is indeed they who are, in whatever capacity, with few exceptions. But let us break



that bubble for you – the idea goes way back. The ‘centuries ago’ kind of way back. This might seem absurd, because we’re given to believe that it is only recently that we began to concern ourselves with matters of general benefit, such as the betterment of the Earth, and seems like only yesterday that we figured

out the tangible nature of the resources that we so effortlessly put to use.

Visionaries are called as much, because they have the ability to see things way ahead of their time. And the world has seen a good number of those. As early as the 14th century, the importance of keeping a leash on the amount of resources we burn. Here, we take you through some events that contributed to the consciousness on environmental awareness, and laid the roots for today’s ideas of ‘green’ living.

► **1306:**

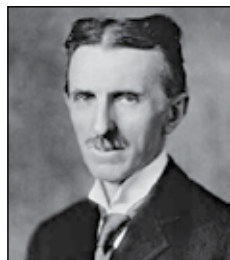
England’s King Edward I tries unsuccessfully to ban open coal fires in England, marking an early attempt at national environmental protection. He was amongst the first monarchs to understand that problems in his kingdom could come from sources other than the enemy.

► **1690:**

Progressive Governor William Penn requires that one acre of forest be saved for every five that are cut down in the newly formed city of Philadelphia. It was amongst the earliest acts of known eco-friendliness in office. It is a step that continues to receive widespread accolades all around.

► **1806:**

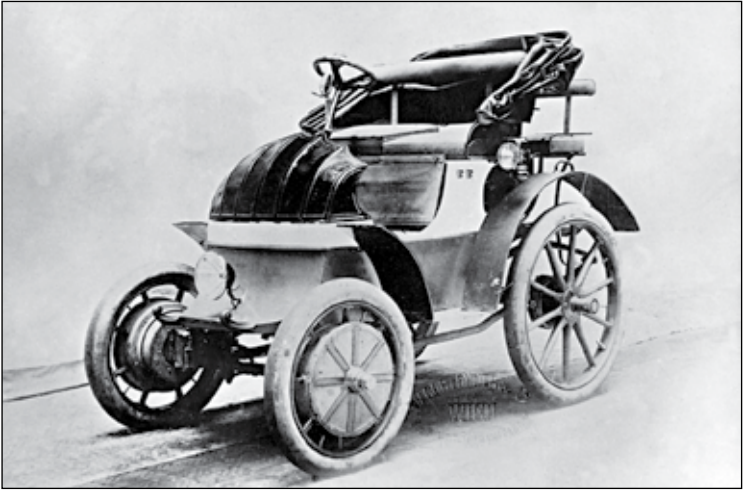
Heat economizer invented. Economizers are, at their core, heat exchangers that are used for a variety of purposes, but to solve for the same end - that of saving energy. Basically, any applications that require efficient transfer of heat - boilers/sinks/ventilators/whatever - make use of the economizer underlay.



► **1856:**

Nikola Tesla is born. You will know more about this in a minute. A lot more.





Lohner-Porsche, the world's first hybrid car

► **1900:**

Ferdinand Porsche builds hybrid electric car. It is almost unreal to think that in a time when even basic electricity to homes was not properly mainstream, a man, albeit with the prominent resources of Mr. Porsche, had the vision to create a technology that would only enter the realms of 'relevance' almost 100 years later. The Lohner-Porsche (that's the name of the car, if you're wondering) isn't a joy to behold by today's standards. But it was an idea. And we all remember what V taught us about ideas...

► **1952:**

The groundwork is laid for the proper framing of the forest policy in India. At this point, though the green cover in the country had been rapidly reducing, but it had still gotten nowhere near alarming levels. Thus, it was good (though arguably rendered pointless due to lack of implementation) forward thinking from the Indian policy makers of the time. The act aimed at keeping one-third of the area protracted under national control for proper supervision.

► **1953:**

Bell Labs create a highly efficient model for a solar cell. Even if it doesn't hold a candle (slight pun there) to the current generation, it was, in all

honesty, the first one that actually counted. Amongst the plethora of gifts to mankind from Bell Labs, it might just turn out to be the most significant one. Time will tell.

Now, of those sequence of events, we take a couple of descriptions to help you put things into perspective better. Let's start with Tesla.

Now, Nikola Tesla has never not been considered an awesome scientist. He has always been up there, whenever a recollection of the most brilliant contributors to modern day life is being done. But it is only recently that the Tesla craze has been picking up any momentum. Facts that have always been out in the open, have now started coming to the fore. And those facts point to one thing – Tesla was a friggin' genius. The word is doled around



Fuel Cell by Bell Labs

very loosely these days, but here was one man who was fit for the accolade. Why is that? Let us have a look at the man's contributions. He basically invented alternating current and pioneered its usage, laid the groundwork for the invention of radio, proposed the radar, the X-rays, the transistors, radio astronomy, neon lighting, wireless communication,

electric motor, remote control, amongst many, many more (the guy held over 300 patents). And these were his more mainstream works.

The guy got to terms with cryogenic engineering almost half a century before the term was invented. He calculated the resonant frequency of the earth, and then went on to create an oscillator that emitted corresponding vibrations, and that reportedly caused an earthquake powerful enough to bring his whole laboratory down with it. Allegedly, the device was 6-inches long. Talk about packing power in 6-inches. He also wrapped his head around something that has escaped the rest of the world up to and since him - ball lightning (basically, lightning curled up in a ball, that is stable and slowly hovers over the ground). That is one feat that is yet to be artificially replicated. Then there was this one enormously ambitious/scary/crazy/awesome plan to build a tower that would supply wireless electricity (so yeah, he was a master in this too, it seems) to the whole world. The whole world, yes. Nobody knows how, or even why, but the story checks out with the

establishments that he was preparing and the supplies that were recovered after his death. The plans could not be recovered, because they lay mainly inside his head (eidetic memory, no kidding), along with many other crazy awesome plans to make the world a supremely advanced place. It's a shame he died early, and broke, and crazy, but let's leave that story to another day.

Now, onto his contributions to the green cause. He was the first person to build a hydroelectric power plant (cheers to our dear friend AC), and prove to the world that this could prove to be a chief provider for our future electrical needs (something that we're yet to properly implement). He was also a great thinker for the cause, and publicly denounced the heavy usage of non-renewable sources of energy. To quote him, "Whatever our resources of primary energy may be in the future, we must, to be rational, obtain it without consumption of any material." That was an incredible bit of forward thinking from the man who died before the first known shortage of oil (1970s). Tesla also did a lot of research work aimed at making a dif-



Parting Thoughts

ference to the thoughtless ways in which mankind produced energy. He proposed what would later be called geothermal energy plants. His was an elaborate plan (as you'd expect), comprising of one section of the plant capturing the heat of the earth, the other floating on the ocean, using the temperature differential between the surface water temperature and the deeper water temperatures to drive turbines to generate electricity. One of Tesla's designs for a floating geothermal plant was published in the pages of the New York Times, complete with pictures and diagrams, in the 1930s. But by the 1930s, oil was being found all over the world in such quantities and with such relatively little output of energy that no one cared much about producing power in other ways.

Tesla also did pioneering work in solar and wind energy harnessing. He said at one of his lectures, "We are whirling through endless space with an inconceivable speed; all around us, everything is spinning, everything is moving, everywhere is energy. There must be some way of availing ourselves of this energy more directly". Not content with just lip service, he did admirable work on the topic too.

All things said and done, it would seem he was trying really, really to make the world around him realize that energy was not limited to the things that can be burnt. Good guy Tesla.



John Etzler

Our next nominee for the most amazing ancient 'green' thinker, is, the much lesser known, one Mr. John Etzler. You might not have heard of him, and that is because he was not the most prominent of thinkers as far as the his era is concerned. But that should not stop you from realizing the power of his dreams. The man was on

the forefront of the movement to promote renewable sources of energy. He spent countless hours in producing what is considered to be a pseudo-bible of the green revolution, 'The Paradise Within The Reach of All Men'. The book contains a collection of visionary plans, that guide the readers on the usability of the renewable resources that they see around them everyday, and was filled with visionary plans to harness the pits of power that were all around them.


He also did remarkable work in contributing to such harnessing, with a nearly-groundbreaking patent to his name, that of propelling locomotives by the use of stationary power (the kind that is making a dramatic return

with fuel cells, efficient energy flow et al). There was another, not-that-groundbreaking one, that of propelling hydro vessels with the help of winds and waves (what else?).

All of this discussion tells us one simple thing – none of what we’re proposing here, is a radical new thought. Gears had been trying to get this movement into motion long ago, but it is only now that there is any discernible movement on the front. Not that this should be surprising, at any level, because humankind has been known to react almost exclusively to swords hanging above their heads – literally and figuratively. Never too late, though. Actually, scratch that. One day, it would be too late. We’re just thankful that it is not today, and even more thankful that you took the time to read this before it was too late. Maybe, just maybe, you’d start by making a difference, whatever the magnitude. As small as ditching plastic bags, maybe. Even if you stick to that for the rest of it, you’d still be doing much more than the majority of the Earth’s population. That, though is not saying much, because an astonishing blind eye seems to be turned whenever the issue is up for popular debate/action. And we hadn’t even cried wolf yet!

Jokes aside, if you do choose to be inspired the way we want you to, with this very focussed (and deep from our hearts) FastTrack, and do a full blown cross-over to the ‘other’ side, we’d be happy for having made a breakthrough. Probably count right up there with the most satisfactory ones on the memories-on-deathbed scenario (disclaimer: we don’t know any actual dead/dying people who’ve had this feeling - we’re sort of going with the gut here).

As a passing thought, let us give you this offer that you can should not refuse:

“Come to the other side – the grass really is greener here.” 



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